

t. Sheppard  
15205-228

# LESSON PLANS

MEDICAL  
& SURGICAL  
TECHNICIANS

*Course*

MEDICAL FIELD  
SERVICE SCHOOL



FORT SAM HOUSTON, TEXAS

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## FOREWORD

The Lesson Plans contained herein are published in accordance with the authority granted in paragraph 3b, letter MEDCT 353 (Brooke Army Medical Center), Office of the Surgeon General, Washington, D. C., dated 13 December 1946, subject: "Enlisted Training."

This publication is published as a means of standardizing instruction in the Medical and Surgical Technician Courses and as a guide to instructors in fulfilling the training mission. These Lesson Plans, except where made mandatory, are intended as a guide only, as a suggested method by which the objectives as outlined for each subject can be attained.

New subject material, ideas, suggestions for improvement, reorganization, rearrangement of instructional periods, or pertinent material are always encouraged by the Department of Training, and when determined as practicable will be incorporated into this publication. The material of necessity will change from time to time, therefore, these Lesson Plans are published in loose-leaf form to permit addition of new material, revised lesson plans, or additional subjects, by the substitution or addition of new sheets. This publication will be kept currently posted.

The following pages represent many officers' combined ideas and efforts, without which this publication would be of much less value. It is not feasible to mention all the ideal means and methods of presenting each period of instruction, but ingenuity, initiative, enthusiasm, close supervision, the injection of realism at every opportunity, a thorough knowledge of the subject, and the opportune use of aids such as charts, film strips, training films, baloptican slides, and the like will further enhance the instruction.

In general, training will be conducted in accordance with the doctrine prescribed in the following:

FM 21-5 "Military Training"  
FM 21-250 "Army Instruction"  
TF 7-295 "Military Training"

Instructors are encouraged to utilize the following publications to the utmost in preparation and planning of each lesson:

FM 21-6 "List and Index of WD Publications"  
FM 21-7 "List of WD Films, Film Strips and  
Recognition Film Slides"  
FM 21-8 "Military Training Aids"

It is suggested that this Volume be tabbed with index markers to facilitate location of subjects.

BY COMMAND OF BRIGADIER GENERAL MARTIN:

*F. L. Watts*  
F. L. WATTS  
Major, PC  
Adjutant



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MASTER SCHEDULE

SUBJECT	Total Hours	Hours per week							
		1	2	3	4	5	6	7	8
1. Anatomy and Physiology	30	6	9	6	7	2			
2. Commandant's Orientation	1	1							
3. Commander's Time	10	2	1	1	1	1	1	1	2
4. Emergency Medical Treatment	32		5	4	2	3	8	2	8
5. Examinations	16	2	2	2	2	2	2	2	2
6. General Training in Hospital Procedures	50	2	5		4	8	4	17	10
7. Hygiene and Prevention of Disease	30	4	3	7	3	4	4	1	4
8. Materia Medica	15					3	7	3	2
9. Mathematics	10	2	2	1	3	2			
10. Organization and Function of Medical Department Units	2	2							
11. Physical Training	40	5	5	5	5	5	5	5	5
12. Public Property	5						2	3	
13. Troop Information Program	8	1	1	1	1	1	1	1	1
14. Ward Management	8	2	1					3	2
15. Ward Procedures	60	8	6	13	12	9	6	2	4
16. History of the Medical Department	1	1							
17. Employment of Medical De- partment Units	2	2							
<b>TOTAL</b>	<b>320</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>



ANATOMY AND PHYSIOLOGY

(1)

PERIOD	HOURS	WEEK	SUBJECT
1	2	1	Introduction
2	2	1	Skeleton
3	2	1	Joints
4	2	2	Muscles, Skin, and Connective Tissue
5	4	2	Circulatory System
6	3	2	Respiratory System
7	3	3	Digestive System
8	3	3	Genito-Urinary System
9	3	4	Nervous System
10	2	4	Special Senses
11	2	4	Endocrine Glands
12	2	5	Surface Anatomy and Its Importance
12	30		<b>TOTAL</b>

1. Purpose and Scope: The purpose of this course is to give students a knowledge of the basic terms used in Anatomy and Physiology, the general structure of the human body, and the fundamental functions of parts of the body. The course should include structure of the cell, postures, and quadrants of the body; functions, structure, and position of bones; classification, structure, and function of joints; function and structure of muscles, skin, and connective tissue; the structure and functions of parts of the circulatory system; the anatomy, mechanics, and physiology of respiration; the anatomy of the digestive system and physiology of digestion; the organs of excretion and their functions; the genital system; the structure and function of the nervous system to include brain, spinal cord and periplural nerves; the structure and functions of the organs of smell, taste, sight, and hearing; the location, structure, and functions of the endocrine glands; relation of the internal organs to the body surface.

2. Standard of Proficiency: At the completion of the course each student should:

a. Be able to identify and locate the principle structures and organs of the human body, and to understand their respective functions.

b. Have a practical and working knowledge of Anatomy and Physiology so that he can understand the principles of treatments in the care of the sick and wounded.

3. Basic References: "Physiology and Anatomy," Greisheimer; "Anatomy and Physiology," Kimber, Gray, Stackpole.

First Period - Two Hours  
Introduction

Place: Classroom

References: TM 8-220, par 16; "Physiology and Anatomy," Greisheimer, Ch 1; "Textbook of Anatomy and Physiology," Kimber, Gray and Stackpole, Ch 1, 2.

Instructional Aids:

Personnel: One instructor

Equipment: Blackboard and chalk, American Frohse charts, and Skeleton

Individual Equipment: Notebook and pencil

1st and 2d Hours - Lecture and Conference

Points to be Covered

1. Introduction

a. The study of the basic principles of Anatomy and Physiology is of importance in the training of Medical-Surgical Technicians. To begin with it should be almost inherent to the curiosity of the average American soldier to want to know what an object is made of and how it works. So it is with the human body. Aside from this, we feel that you, in your relationship with patients of all sorts, whether they be on a ward in peace time or a casualty in a fox hole during war can be greatly benefited. Not only this but the type of care can be a much more intelligent and understanding one. The majority of you have undoubtedly been confronted with the repair--emergency or otherwise--of some mechanical object, e.g. broken down Model-T, model airplane, tractor, radio, etc. Needless to say that unless you understand the construction and mechanism of said object your results are SNAFU and your time is wasted. Many times the object of your labor will be worse off than before your feeble attempts at repair. So be it with the human body. On many occasions, especially in war but also in civilian accidents, it may be your responsibility to care for an individual until he

can be seen by trained medical personnel. Needless to say that the prompt intelligent service which you may give could and many times is life saving. The medical corps feels that we can definitely aid you in this respect by teaching Anatomy and Physiology. These two subjects are the backbone of our professional knowledge. We hope that we can enlighten you on many subjects which you have always wondered about.

## 2. Explanation

a. Anatomy--study of the structure of the body--how the body is built.

### (1) Types

- (a) Macroscopic or gross - that which can be seen by the naked eye.
- (b) Microscopic - that which can be seen with the aid of a microscope.

### (2) Orientation as to terms--descriptive words used in Anatomy.

- (a) Anatomical position--body erect, arms to sides with palms turned forward.
- (b) Dorsal--refers to the back.
- (c) Ventral--refers to the front.
- (d) Anterior--in front.
- (e) Posterior--in back.
- (f) Superior--toward the head.
- (g) Inferior--toward the feet.
- (h) Medial--toward the mid line.
- (i) Lateral--away from the mid line.
- (j) Proximal--toward the source.
- (k) Distal--away from the source.
- (l) Central--at or toward the center.
- (m) Peripheral--around the edge.

### (3) Basic concepts of Anatomy

- (a) Protoplasm--living matter of which all living forms are made.
- (b) Cell--smallest structural unit in the body. Seen only by microscope. Lowest animal forms consist of only one cell. The higher forms are made up of combinations of up to billions of cells.

1. Cytoplasm
2. Nucleus
3. Cell membrane

- (c) Tissues--groups of similar cells fitted together for a particular function.
- (d) Organs--groups of tissues of different types which are formed to provide definite body function, e.g. stomach, kidneys, lungs, etc.
- (e) Systems--groups of organs working together for common purpose.
  - 1. Skeletal--(bones, ligaments for support)
  - 2. Muscular--(muscles for movement)
  - 3. Nervous--(brain, spinal cord, nerves)
  - 4. Circulatory--(heart, blood vessels, blood)
  - 5. Respiratory--(nose, throat, larynx, trachea, bronchi, lungs)
  - 6. Digestive--(mouth, esophagus, stomach, intestines)
  - 7. Urinary--(kidneys, ureters, bladder, urethra)
  - 8. Reproductive--(testes, ovaries, uterus, etc)
  - 9. Endocrine--(glands--thyroid, pituitary, etc)

b. Physiology--study of the functions of the body--how it works.

- (1) Physiology deals with living matter. Living matter has certain qualities which distinguish it from non-living matter.
  - (a) Irritability--(ability to respond to stimulation)
  - (b) Conductivity--(ability to transfer a change)
  - (c) Contractility--(ability to shorten when stimulated)
  - (d) Growth--(build and increase amount of protoplasm. Ability to change food into protoplasm and burn food or protoplasm for heat or energy.)
  - (e) Reproduction--(ability to produce more of the same kind)

(2) In this course physiology can only be explanatory.

### 3. Demonstration

a. Use of charts and diagrams in conjunction with lecture.

#### Training Notes

- 1. Stress overall picture and scope of the course in Anatomy and Physiology.
- 2. Stress introduction of vernacular used.

Second Period - Two Hours  
Skeleton

Place: Classroom

References: TM 8-220, Ch 2 Sec 1; "Physiology and Anatomy," Greisheimer, Ch 3; "Textbook of Anatomy and Physiology," Kimber, Gray and Stackpole, Ch 5; "Gray's Anatomy."

Instructional Aids:

Personnel: One instructor

Equipment: Skeleton, American Frohse charts, Non-standard diagrams, blackboard and chalk.

Individual Equipment: Notebook and pencil

3rd and 4th Hours - Lecture, Conference, Demonstration

#### Points to be Covered

##### 1. Introduction

a. The bony skeleton is the chief organ of support, and is passively concerned with locomotion. It forms a framework made up of many bones of irregular shapes. The skeleton is flexible through its joints but as a whole it is rigid and offers a firm foundation. It offers attachment for muscles and soft parts maintaining them in position and offering them protection. There are 206 individual bones in the body. Skeleton to be broken down for discussion according to anatomical parts e.g. extremities, spine, skull, etc.

##### 2. Explanation

###### a. Classification of bones

- (1) Long bones - (consists of shaft and two (2) extremities)
- (2) Short bones - (irregular, spongy texture. Found in hand, feet, and patella.)
- (3) Flat bones - (where chief requirement is protection or when broad surfaces are needed for muscular attachment e.g. bones of skull).
- (4) Irregular bones - Because they do not fit other descriptions, e.g. vertebrae and bones of ear.

###### b. Discussions of the skeleton

- (1) Head or skull: Firm case of covering for the brain. Made up of 22 bones and may be divided with those forming the cranium and those forming the face.
  - (a) Cranium - (1 occipital; 2 parietal; 2 temporal;

1 frontal; 1 sphenoid; 1 ethmoid. Total eight (8.)

(b) Face - (2 nasal; 1 vomer; 2 inferior nasal conchae; 2 lacrimal; 2 maxillae; 2 malar (zygomatic); 2 palatine; 1 mandible. Total fourteen (14.)

(c) Middle Ear - (malleus (hammer); incus (anvil); stapes (stirrup). Total six (6.)

(2) Neck - Hyoid bone - in front of Adams apple. Anchors muscles which control tongue and larynx.

(3) Trunk

(a) Vertebral, spinal column or spine.

1. Cervical - 7 vertebrae - Support the skull. First two (2) vertebrae are most important in the movement of the skull. 1st or atlas allows for backward and forward movements. 2d or axis allows for sideward motion of the atlas and hence the head.
2. Thoracic - 12 in number - forms spine in posterior portion of chest. Serves for support of the ribs.
3. Lumbar - 5 in number - Form the "small" of the back.
4. Sacral - 5 in number - Fused. In between the bones of the pelvis.
5. Coccygeal - 4 in number - Fused. Rudimentary. "Tail bone."

(b) Thorax or chest cage

1. Ribs - 12 in number - curved. Attached to spinal column, not fixed. Move with respiration so as to increase the size of chest cavity.
2. Sternum or "breast bone" - flat and wide. Serves to complete structure of the thorax. Offers attachment for the costal cartilages.

(4) Upper Extremity

(a) Shoulder girdle - Constructed to offer maximum motion of extremity. Consists of clavicle or "collar bone" and the scapula or "shoulder blade." Scapula offers the socket for the humerus. The clavicle offers support to the joint in maintaining its lateral position.

(b) Arm - humerus - shoulder to elbow.

(c) Forearm

1. Radius - thumb side
2. Ulna - little finger side

- (d) Wrist - 8 bones - carpal - irregular.
- (e) Hand - 5 bones - metacarpals.
- (f) Finger - phalanges - 14 in number.

### (5) Lower Extremity

- (a) Pelvic Girdle - Formed by articulation of pelvic bones anteriorly and the pelvic bones and the sacrum posteriorly. A very rigid firm arch. Designed for support. Motion of legs primarily in the antero-posterior direction. The femur fits into a socket afforded by the innominate bone. Held in place by muscles and ligaments.
- (b) Thigh - Longest bone in body - the femur. Extends from hip to knee.
- (c) Knee - Formed by the joint between the femur and the tibia. The overlying flat, round bone is the patella.
- (d) Leg
  - 1. Tibia - larger leg bone. On the inside of the leg. The "shinn" bone.
  - 2. Fibula - small bone of the leg. Not absolutely necessary for support.
- (e) Foot - Made up of many small irregular bones.
  - 1. Tarsals - 7 in number
  - 2. Metatarsals - 5 in number
- (f) Toes - 14 phalanges.

### 3. Demonstration

- a. To include American Fresho charts, and non-standard diagrams. Models (skeleton) are available. To be used in conjunction with the lectures.

### Training Notes

- 1. Stress the purpose and structure of the framework of the body.

### Third Period - Two Hours

#### Joints

Place: Classroom

References: TM 8-220, Ch 2, Sec I; "Physiology and Anatomy," Groisheimer, Ch 3; "Textbook of Anatomy and Physiology," Kimber, Gray and Stackpole, Ch 7; "Gray's Anatomy."

Instructional Aids:

Personnel: Instructor

Equipment: American Frohse charts; Non-standard diagrams; Skeleton; Blackboard and chalk.

Individual Equipment: Notebook and pencil

5th and 6th Hours - Lecture, Conference, Demonstration

Points to be Covered

1. Introduction

a. The contact area between two (2) bones is called a joint. The joint is made up of two (2) bones either in direct contact (skull) or separated by one or several types of tissue. These may include very thin serous membranes or very dense, thick connective tissue or fibre-cartilage. In the freely moving joints a joint space actually exists. The joints are supported by muscle tendons, ligaments, and strong fibrous fibers or capsules to completely surround the joint. Joints may be classified as to movement e.g. immovable, slightly movable, and freely movable.

2. Explanation

a. Immovable (synarthrosis)

- (1) Bones connected by fibrous tissue or cartilage
- (2) Bones in close contact.
- (3) Examples - bones of face and skull.
- (4) Sutures - interlocking union of bones.
  - (a) Coronal - fronto-parietal
  - (b) Sagittal - parietal
  - (c) Lamboidal - parieto-occipital

b. Slightly movable (amphiarthrosis)

- (1) Joined by broad flattened discs of fibro-cartilage and/or by ligaments.
- (2) Examples
  - (a) Between bodies of vertebrae.
  - (b) Between pubic bones (symphysis pubis).
  - (c) Between sacrum and ilia.
  - (d) Between tibia and fibula at point of interosseous ligament.

c. Freely movable joints (Diarthroses) true joints.

- (1) Most of joints of body.

(1)

- (2) Ends of bone covered by fibro-cartilage and surrounded by fibrous capsule, strengthened by ligaments and lined by serous membrane (to lubricate the joint).
- (3) Examples
  - (a) Gliding joints - carpal and tarsal bones
  - (b) Hinge joints - flexion and extension. Elbow; ankle; finger joints.
  - (c) Pivot joints - rotary motion: atlas on axis; radius on ulna.
  - (d) Ball and socket - movement in all directions: shoulder joint; hip joint.

d. Common joint disorders

- (1) Housemaid's knee - fluid in synovial sac.
- (2) Trick knee - loose semilunar cartilage.
- (3) Sprain - twisting joint with tearing or stretching of ligaments or tendons.
- (4) Dislocations - displacement of bone
- (5) Ankylosis - fixed joint.

3. Demonstration

- a. To be incorporated with the explanation with the use of the skeleton and charts.

Training Notes

1. Stress understanding of types and components of joints.

Fourth Period - Two Hours  
Muscles, Skin, and Connective Tissue

Place: Classroom

References: TM 8-220, Ch 2 Sec 1; "Physiology and Anatomy," Greisheimer, Ch 4; "Textbook of Anatomy and Physiology," Kimber, Gray and Stackpole, Ch 4, 7 and 22; "Gray's Anatomy."

Instructional Aids:

Personnel: Instructor, one projectionist

Equipment: American Frisch Charts; Non-standard diagrams; Blackboard and chalk; FS 8-79; one projector; one screen.

Individual Equipment: Notebook and pencil

7th and 8th Hours - Lecture, Conference, Demonstration

## Points to be Covered

### 1. Introduction

a. Motion is an important activity of the body made possible by the action of various muscle groups acting simultaneously or in rapid fire succession. Muscle cells have four characteristics peculiar to them which makes possible their all important functions: irritability; contractility; extensibility; elasticity. IRRITABILITY is property of reacting to stimuli and is common to all cells. CONTRACTILITY is property allowing muscles to change shape and become shorter and thicker. EXTENSIBILITY means that muscle tissue readily return to original form when stretching force is released.

### 2. Explanation

#### a. Muscles

##### (1) Types of muscle tissue

- (a) Striated: Skeletal; Voluntary: acts upon skeleton.
- (b) Smooth: Involuntary; act within organs.
- (c) Cardiac: Controls the heart.

##### (2) Physiology of muscle action

- (a) Stimulation--nerve impulse
- (b) Contraction--response to stimulation

##### (3) Mechanics of muscle action

- (a) The rule or law of levers.
- (b) The combination of muscles and bones to form levers.

##### (4) Main skeletal muscles

###### (a) Face

- 1. Muscles of eye and eyelid.
- 2. Muscles of mastication (chewing) - Masseter and temporal.
- 3. Muscles of mouth and lips.

###### (b) Neck - Sternocleidomastoid - muscles of moving head

###### (c) Back

- 1. Trapezius - to shrug the shoulder; to elevate the head.

2. Erector Spinae - holds spine erect.

(d) Chest - Pectorales major - helps to move arm.  
 (e) Diaphragm--dome shaped; flat, leaf like fibers run radially. Separates abdomen from thoracic cavity. Flattens when it contracts.

1. Openings

a. Esophageal - esophagus, nerves, arteries  
 b. Aortic - Aorta and thoracic duct  
 c. Vena Canal - Inferior vena cava and nerves

(f) Abdomen

1. Transverse - rotate spine. Squeeze abdomen.  
 2. Oblique - rotate spine. Squeeze abdomen.  
 3. Rectus abdominis from ribs to pubic - flexes trunk.

(g) Upper extremity

1. Deltoid--Covers shoulder, raises arm.  
 2. Biceps--On front of arm. Flex forearm at elbow.  
 3. Triceps--On back of arm. Extends elbow.  
 4. Extensors and flexors of wrist.  
 5. Extensors and flexors of fingers.

(h) Lower extremity

1. Buttock - 3 gluteal muscles help to move the thigh.  
 2. Thigh

a. Hamstrings--on back of thigh. They flex (bend) the knee.  
 b. Quadriceps--on front of thigh. Extend (straighten) the knee. One portion (rectus femoris) flexes the thigh on the abdomen.  
 c. Internal thigh muscles: Used in crossing the legs and pulling one leg toward the other.

(i) Leg

1. Anterior-- those concerned with flexing the ankle.

2. Posterior -- those conceived with pointing the toe. Tendon of achilles.

(j) Foot - many small muscles in the foot mainly concerned with movements of the toes.

b. Skin

(1) Structure

(a) Epidermis--Outer layer. Many dead cells. Deeper layers living and new cells push outward and die. Contains pigment.

(b) Dermis--Inner layer contains nerves, blood vessels and glands. Glands are sweat glands and oil glands. Hair follicles.

(2) Functions

(a) Protection--from physical damage; from drying; from bacterial invasion.

(b) Temperature regulation.

(c) Contains receptor organs of secretion.

(e) Excretion--sweat glands.

c. Connective Tissue

(1) Definition--that which binds tissue together. Serves as padding to fill in space.

(2) Types

(a) Cartilage--between vertebrae; in lung tree.

(b) Fibrous--ligaments, tendons.

(c) Bone--skeleton

(d) Liquid--blood

(e) Elastic--In walls of blood vessels and lungs.

(f) Fat--under skin and around organs.

3. Demonstration

a. FS 8-79, the use of American-Frohse charts, non-standard diagrams, and the skeleton in close conjunction with the lecture.

Training Notes

1. Stress importance of knowledge of function and characteristics of muscle tissue.

2. Stress function of connective tissue.

3. Stress functions of the skin.

**Fifth Period - Four Hours**  
**Circulatory System**

**Place:** Classroom

**References:** TM 8-220, Ch 2, Sec 1; "Physiology and Anatomy," Grisham, Ch 11; "Textbook of Anatomy and Physiology," Kimball, Gray and Stackpole, Ch 14; "Gray's Anatomy."

**Instructional Aids:**

**Personnel:** One instructor, one projectionist

**Equipment:** American Frohse charts; Non-standard diagrams; TF 8-1388 - Blackboard and chalk; one projector; one screen.

**Individual Equipment:** Notebook and pencil

**9th, 10th, 11th, and 12th Hours - Lecture, Conference, Demonstration**

**Points to be Covered**

**1. Introduction**

a. The circulatory system is a group of organs concerned with the transportation of fluid (blood) from one part of the body to another. The fluid carries food stuffs and oxygen to the tissues and waste products from the tissues. These waste products are then eliminated by various specialized organs through which the blood passes. The close relationship between the respiratory and the circulatory systems must be emphasized. The interchange of gases between the air in the lungs and the blood is very rapid and essential to life. A discussion of the blood itself will be covered in these lectures. The lymphatic system, because of its close association to blood circulation will also be considered.

**2. Explanation**

a. Blood and Lymph. Fluids which circulate throughout the body in closed tubes. Flow kept constant by action of heart. Tissue fluid in intercellular spaces is lymph. Returned to circulation by separate vessels, the lymphatics.

**(1) Blood**

(a) Functions: supply tissues with food and oxygen; carry away wastes; regulate body temperature.

(b) Quantity--1/20 of body weight of 90cc per kg. 5000 to 6000 cc in the average man.

(c) Morphology--opaque, color varies with degree of oxygenation. 50 to 60% plasma.

(d) Constituents:

1. Red cells--carry oxygen and hemoglobin.
2. White cells--fight infection.
3. Platelets--very adhesive. Release cephalin which begins clotting.
4. Plasma--fluid portion after cells are separated.

(e) Clotting--clot consists of fibrin network matted with red and white cells. Method of coagulation: Calcium plus Prothrombin plus Cephalin equals Thrombin. Thrombin plus Fibrinogen equals Fibrin. Heparin is carried in blood and prevents clotting in vessels. Normal clotting time is 3 to 4 minutes.

(2) Lymph--tissue fluid. Means through which exchanges between blood and tissues take place. Formed by filtration through capillary walls. Similar to plasma but contains less protein.

b. Anatomy of the blood vascular system:

(1) The heart:

(a) Heart is a hollow, muscular, four-chambered organ. It has great vessels leading to and from it.

(b) Pericardium--a double walled sac about the heart. The inner layer is closely adherent to the heart and between the layers there is a very thin space which is lubricated with a clear watery fluid.

(c) Chambers of the heart:

1. Right auricle--receives venous blood
2. Right ventricle--receives venous blood from right auricle and forces it into the pulmonary artery and hence through the lungs.
3. Left auricle--receives oxygenated blood from the lungs via the pulmonary veins.
4. Left ventricle--receives oxygenated blood from left auricle and forces it into the aorta and hence to the body tissues.

(d) Valves of the heart--a series of "flutter" or "butterfly-like" valves between chambers of the heart to prevent the reverse flow of blood. Also at the opening of the aorta and the vena cavae.

(c) Blood supply of the heart--coronary arteries from aorta. Those may become shut off in heart attack.

(2) Arteries--carry blood away from the heart. Become progressively smaller in size as they travel away from the heart. Divide and subdivide many times to reach all body tissues. They are extensible and elastic. Walls are strong, and muscular, pulsate to transport blood through body.

(3) Veins carry blood to the heart. Walls thinner than artery. Less elastic than arteries.

(4) Capillaries--carry blood from arteries to veins. Very thin. Here exchange between blood and tissue spaces takes place.

(5) General plan of the blood vascular system. Here describe the course of blood from the right side of the heart to the left and from the left through the systemic circulation. This is to be a general picture only.

(a) Pulmonary circulation--describe briefly the main vessels, e.g., the pulmonary arteries and veins.

(b) Systemic circulation--here only the main divisions to be described.

1. Aorta--chief trunk. Provides branches to all body organs, extremities, and tissues.
2. Common carotid--large artery in neck to supply head, face, and brain. The facial and temporal arteries are the branches which are concerned at the "pressure points" on the skull.
3. Subclavian and brachial provide blood to upper extremities.
4. Mesenteric arteries (superior and inferior) --supply blood to intestines.
5. Iliac arteries--terminal division of aorta-- provide the iliac and femoral arteries to the lower extremities.

(c) Veins: In general the veins parallel the arteries and frequently have the same names. They drain the areas supplied by the arteries. Venous blood is dark due to loss of oxygen and flows steady stream--no pulsation. The smaller veins gradually empty into larger ones. The lower extremities and abdominal contents drained by inferior vena cava. The upper extremities, head and neck are drained by the superior vena cava.

These two large veins both empty into the right auricle. The venous drainage from the brain is of special type and will be described under the nervous system.

c. Lymphatic system. Consists of:

- (1) Networks of Lymphatic Capillaries which collect lymph from tissue spaces.
- (2) A System of Lymphatic Vessels which conduct lymph to the subclavian vein and hence into the blood stream.
- (3) Lymph Nodes which lie along the course of the vessels and filter the lymph and help to remove bacteria and add lymphocytes which combat infection.
- (4) The spleen is the largest collection of lymph tissue in the body. Forms lymphocytes. Acts as reservoir to red blood cells. Helps remove debris from dead red blood cells.

d. Physiology:

- (1) The heart is a pump.
- (2) Property of rhythmic contractility is highly developed in heart.
- (3) Diastole (period of rest and recovery in heart beat cycle) and Systole (period of contraction or activity in heart beat cycle.)
- (4) Double nerve supply to heart:
  - (a) Speeds the heart.
  - (b) Slows the heart.
- (5) The blood exerts pressure in the vessels--blood pressure. It is a constant pressure maintained by two forces:
  - (a) Force of the heart.
  - (b) Force of the contraction of the blood vessels.
- (6) Blood pressure varies with:
  - (a) Rate of the heart.
  - (b) Force of the heart.
  - (c) Peripheral resistance in arterioles.
  - (d) Quantity of blood in system.
  - (e) Viscosity of blood.
- (7) Blood pressure:
  - (a) Systolic 100-140 mm mercury. The pressure during systole of the heart, e.g. when volume of blood is forced into blood vessels.

- (b) Diastolic 60-90 mm mercury. The pressure during diastole of the heart which is maintained by the elastic contraction of the blood vessels.
- (c) Measured by sphygmomanometer.
- (d) Blood pressure influenced by age, weight, heredity, emotions, exercise.

(8) Pulse. The distention of the artery as heart goes into systole and volume of blood is forced out. May be taken at radial, temporal, carotid, popliteal, femoral arteries.

(9) Nervous control--vasomotor nerves. Control the arterioles. Vasoconstrictor nerves decrease the size of arterioles; vasodilator nerves enlarge the vessels. By this, blood may be shifted from one area to another.

### 3. Demonstration

a. TF 8-1388 with lectures. Charts and diagrams are to be used freely with the lectures.

#### Training Notes

1. Stress normal anatomy and physiology of heart and other components of the circulatory system.
2. Stress location of pressure points for pulse.
3. Stress physiology of blood pressure.

#### Sixth Period - Three Hours Respiratory System

#### Place: Classroom

References: TM 8-220, Ch 2, Sec 1; "Physiology and Anatomy," Greisheimer, Ch 15 and 16; "Textbook of Anatomy and Physiology," Kimber, Gray and Stackpole, Ch 17; "Textbook of Physiology," Best and Taylor; "Gray's Anatomy."

#### Instructional Aids:

Personnel: One Instructor, one projectionist

Equipment: American-Frohse charts; Non-standard charts; Manikins; TF 8-1389; Blackboard and chalk; one projector; one screen.

Individual Equipment: Notebook and pencil

13th, 14th, and 15th Hours - Lecture, Conference, Demonstration

Points to be Covered

1. Introduction

a. Respiration is the exchange of gases necessary for the life of the cell. This concerns the taking up of oxygen by the cell and the throwing off of the waste product carbon dioxide. The supply must meet the demand. Hence, the process must be continuous. In man, the circulating blood in the livings take up oxygen and throws off carbon dioxide; whereas, later in the capillaries the blood gives up its oxygen to the cells and receives in return carbon dioxide. This is a continuous process and must be if the body is to remain a live and in good working order.

2. Explanation

a. Accessory organs:

(1) Nose--special organ of smell, but also serves as passageway for air going to and from the lungs.

(a) Divisions--External and Internal  
(b) Openings

1. External nares  
2. Internal or posterior nares which open into nasopharynx.

(c) Functions:

1. Source of smell-covered later lecture.  
2. Path of inspired air.  
3. Moisture inspired air.  
4. Serves as filter to remove small foreign particles.  
5. Gives resonance to phonation.

(2) Mouth--of importance for ingestion of foods but also serves as passageway for air going to and from the lungs.

(3) Pharynx--not a primary organ of respiration but certainly essential. Serves as common passageway for air going to and from the mouth and nose.

b. Respiratory Tract--Primary organs.

(1) Larynx - the organ of the voice - "Adams apple"

(a) Location--front part of neck. Lies between the great vessels of neck. In front of the

(b) esophagus (gullet).

(b) Structure--a series of cartilaginous rings attached with ligaments and muscles. Contains 2 horizontal fibrous bands called the **vocal cords**. The spoken voice is produced by the sound which results as air passes through and over these cords while they are in various degree of tension.

(c) Function

1. Voice organ  
2. Passage of air to and from the lung

(2) Trachea or wind pipe--A non-collapsible tube about  $3/4$ " in diameter which is continuous with the larynx above and divides into the bronchi below.

(a) Location--begins just below the "adams apple" and extends down the neck to a point just below the junction of the clavicles and the sternum.

(b) Structure--a series of cartilaginous rings connected by muscles and ligaments.

(c) Function--air passageway.

(3) Bronchi and Bronchial tree. The trachea divides into two divisions each of which is also a non-collapsible tube. One of these tubes goes to each lung. As the tube passes through the lung it divides within itself many thousands of times and each division produces a smaller tube. Eventually each tube is only several cells in thickness. It is about these very thin walled tubes or sacs that the tiny blood capillaries are found. It is here that the outer change of oxygen and carbon dioxide takes place.

(4) Lungs:

(a) Location--each chest cavity

(b) Structure--basic unit is lobule which consists of the fewest division of the bronchi with their terminal thin walled tubes and membranous out pouchings called alveoli. The lobule also contains its network of blood vessels, lymphatics, and nerves. Lungs separated one from other by the mediastinum.

(c) Function--to afford the mechanism of interchange of oxygen and carbon dioxide.

(d) Blood supply--From the right side of the heart the lung receives unoxygenated (blue) blood.

This by means of the pulmonary artery. After the blood has passed through the lung it is returned to the left side of the heart by the pulmonary vein and it is then oxygenated.

c. Mechanics of respiration:

- (1) Expansion of thoracic cage; elevation of ribs lowering of diaphragm.
- (2) Establishment within lung of pressure less than atmospheric. This causes air to be sucked in.
- (3) Contraction of lung tissue, elevation of diaphragm, and lowering of ribs produce expiration.
- (4) Interchange of gases as described under "Introduction."

3. Demonstration

- a. TF 8-1389, American Frohse charts and non-standard diagrams, models as available to be used in conjunction with the lectures.

Training Notes

1. Emphasize meaning of respiration
2. Stress mechanics of respiration
3. Emphasize exchange of gasses which occurs during respiration.

Seventh Period - Three Hours  
Digestive System

Place: Classroom

References: "Physiology and Anatomy," Greisheimer, Ch 15 and 16; "Anatomy and Physiology," Kimber, Gray, Stackpole, Ch 18, 19, 20; "Textbook of Physiology," Best and Taylor; "Anatomy," Gray; TF 1390 "Digestion of Foods" (10 minutes)

Instructional Aids:

Personnel: Instructor, one projectionist.

Equipment: American Frohse charts; Non-standard diagrams; Manikin; TF 1390, "Digestion of Foods;" one projector; one screen.

Individual Equipment: Notebook and pencil

16th, 17th and 18th Hours - Lecture, Conference, Demonstration

Points to be Covered

1. Introduction (Digestion)

a. Digestion is the method by which complex food substances are broken down into simple diffusible components capable of diffusing into the blood stream to be distributed to the cells of the body for vital consumtion. The methods are both physical (peristolsis) and chemical (enzymes) and constitute the digestive process. The individual organs make up the digestive tract.

2. Explanation

a. Anatomy

(1) Alimentary Canal - tube 30' in length extending from the mouth to the anus. The accessory organs (salivary glands, pancreas, etc) empty secretion into the canal.

(a) Structural plan. Four (4) tissue layers:

1. Mucosa
2. Submucosa with glands and blood vessels
3. Involuntary muscle layers
4. Outer limiting layers

(b) Divisions

1. Mouth--divided into vestibule (between teeth and lips) and oral cavity.

a. Teeth - 32 in number - 4 Incisors, 2 Caninos, 4 premolars, 6 molars.  
b. Tongue - mastication, digestion, talking and taste.

2. Pharynx (throat cavity). Opens into nose, mouth, and larynx. Common passageway for food and air.

3. Esophagus (gullet). Straight tubular passageway connecting pharynx and stomach. Solid foods aided by peristaltic contractions of wall.

4. Stomach. Most dilated portion of tract. Divisions are cardiac and pyloric portions. Glands within walls secrete gastric juice. Solid food particles broken up into finely divided meal by churning action of stomach as result of peristalsis.

5. Small Intestine. Divided into duodenum, jejunum, and ileum. Intestinal glands located along the course and secrete intestinal juices. Curled on itself many times.

6. Ends at the cecum. Food propelled by means of peristalsis (Explain)

6. Large Intestine. Divided into cecum, ascending colon, transverse colon, descending colon, sigmoid colon, and rectum. The cecum is a blind pouch hanging below point of entry of ileum. Appendix attached to cecum.

(2) Peritoneum: The lining of the abdominal cavity. It is reflected or invaginated over the viscera. Provides moist, smooth surface for movement of one portion of intestinal tract against the other.

(3) Accessory organs to digestion:

- (a) Teeth
- (b) Tongue
- (c) Salivary Glands. Secrete saliva into mouth. Saliva moistens food for lubrication.
  - 1. Parotids - pre auricular area
  - 2. Submaxillary - under the lower jaw
  - 3. Sublingual - under the tongue
- (d) Liver. Largest gland in body. Secretes bile. Stores sugar. Powerful detoxifies manufactures prothrombin. Maintains blood proteins.
- (e) Gall bladder. Located just beneath the liver. Serves to store and concentrate bile.
- (f) Pancreas. Contains cells for the secretion of pancreatic digestive juice and those which produce insulin.

b. Physiology

(1) Classification of foods. Water, carbohydrate, fat, protein, minerals, vitamins. Give chief function of each.

(2) Digestive Process

- (a) Mouth - Chiefly mechanical (mastication, deglutition)
- (b) Pharynx - Mechanical-propulsion from constrictors muscles. Food passed to opening of esophagus. Give mechanism of closing the larynx by the epiglottis.
- (c) Esophagus - Peristaltic propulsion of solid foods. Liquids pass by gravity.
- (d) Stomach
  - 1. Mechanical--peristalsis or contraction varies, churn the food and divide it into small meal-like particles.

2. Chemical--Gastric juices begin to chemically break down complex food stuff's into simpler absorbable components.

(e) Small Intestine - Majority of digestion. Aided by pancreatic juice and bile. Food propelled by peristalsis. Here the absorption of food stuff's take place.

(f) Large Intestine - Here the absorption of fluid from the semi solid food bolus takes place leaving a soft mass of waste material known as feces. This fecal material is passed on to the rectum and then through the anus.

(g) Chemical digestion carried on by a number of substances called Eugymes. These are found in the various digestive juices and are specific for the particular food stuff they act upon.

### 3. Demonstration

a. Use American Frohse charts, non-standard diagrams and manikin to show structure of parts.

b. Show TF 8-1390, "Digestion of Foods."

#### Training Notes.

1. Emphasize relationships between digestion and the type of food eaten.

#### Eighth Period - Three Hours Genito-urinary System

#### Place: Classroom

References: TM 8-220, Ch 2, Sec I; "Physiology and Anatomy," Greisheimer, Chs 17, 18; "Textbook of Anatomy and Physiology," Kimber, Gray and Stackpole, Ch 21; "Textbook of Physiology," Best and Taylor; "Gray's Anatomy."

#### Instructional Aids:

Personnel: One instructor, one projectionist

Equipment: American Frohse Charts; Non-standard diagrams. TF 8-1392; Models; Blackboard and chalk; one projector; one screen.

Individual Equipment: Notebook and pencil

Points to be Covered

1. Waste Products and Excretory Organs

a. Excretory Organs

- (1) Kidneys
- (2) Lungs
- (3) Alimentary Canal
- (4) Skin

b. Waste Products

- (1) Water
- (2) Carbon dioxide
- (3) Salts - Organic nitrogenous
- (4) Heat

c. Waste Products Excreted by each organ

- (1) Kidneys - water, salts from protein metabolism
- (2) Lungs - Carbon dioxide, heat, water
- (3) Alimentary Canal - Solids, bacteria, secretions, heat
- (4) Skin - Heat, water, salts, nails, hair, etc.

2. Urinary System

a. Kidneys

- (1) Location
- (2) Structure - nephron is functional unit
- (3) Function - Filters the blood and rids the blood of nitrogenous materials existing over and above normal plasma concentrations. Rids the body of many poisons and toxins.
- (4) Abnormal constituents of urine: (Blood, pus, sugar, albumen, calculi, corts)

b. Ureter

- (1) Location
- (2) Structure - small, hollow tubular structure
- (3) Function - passageway for urine from the kidney to the bladder. Urine propelled by peristalsis.

c. Bladder

- (1) Location
- (2) Structure - hollow muscular walled organ. Capable of being distended to considerable proportions. Contains

a circular sphincter muscle, the valve of which prevents flow of urine unless relaxed as during micturition.

(3) Function - to store urine until sufficient volume has collected to produce desire and need for urination.

c. Urethra

- (1) Location
- (2) Structure - Relationship of prostate gland to proximal portion of urethra.
- (3) Function - Passageway for urine for bladder through the penis.

3. Genital System

a. Male

- (1) Testicles
  - (a) Location
  - (b) Function - Produce sperm and male sex hormones.
- (2) Vas Deferens or Ductus Deferens
  - (a) Location
  - (b) Function - to transmit sperm from testicles to urethra.
- (3) Seminal Vesicles
  - (a) Location
  - (b) Function - add fluid medium in which sperm are suspended and carried during ejaculation.
- (4) Mechanism of Erection - A constriction of veins draining the penis due to nervous stimulation from sexual excitement with resultant pooling of large volumes of blood in the penis.

b. Female

- (1) Ovaries
  - (a) Location
  - (b) Function - Produce egg or ova once a month. Produces female sex hormones.
- (2) Fallopian Tubes

- (a) Location
- (b) Function - Pick up the ova and carry it into the cavity of the uterus.

(3) Uterus

- (a) Location
- (b) Function - Serves as the site for development of the fertilized ova. Becomes greatly enlarged as the fetus grows. Muscular wall force the baby out following full development.

(4) Vagina

- (a) Location
- (b) Function - A blind pouch into which sperm are deposited. Contains the lower open end of the uterus through which sperm travels to fertilize the egg within the cavity of the uterus.

Training Notes

1. Emphasize relation between genital and urinary systems.
2. Place greater emphasis on male genito-urinary system than on female.

Ninth Period - Three Hours  
Nervous System

Place: Classroom

References: TM 8-220, Ch 2, Sec I; "Physiology and Anatomy," Greishamer, Ch 6 and 7; "Textbook of Anatomy and Physiology," Kimber, Gray and Stackpole, Ch 8 and 9; "Textbook of Physiology," Best and Taylor; "Gray's Anatomy."

Instructional Aids:

Personnel: Instructor, one projectionist

Equipment: American-Frohse charts; Non-standard diagrams; TF 8-1393; Blackboard and chalk; one projector, one screen.

Individual Equipment: Notebook and Pencil

21st, 22d, and 23rd Hours - Lecture, Demonstration, Conference

Points to be Covered

1. Introduction

a. The nervous system is that structure within the body which makes possible a rapid correlation between widely separated parts of the body. It accomplishes this by a complicated but efficient system for transmitting impulses from one portion of the body to another via the brain or spinal column or both. Two (2) properties vital to nervous tissue are irritability and conductivity. There are some nerve cells which are highly sensitive to stimulation and hence have a high degree of irritability. There are other portions of the nervous system which serve only to conduct nerve impulses from one location to another after the impulse has once been initiated. The nervous system can be likened to an automatic telephone exchange. The brain and spinal cord are the central exchange. The nerve fibers leading to and from the brain and spinal cord are the wires from one phone to another. When one dials a number he starts with the voluntary act of dialing a particular number. From here on he has nothing to say of the outcome and in 99% of the cases he gets the right number. So be it with the nervous system. When we want to raise an arm or move a foot we first of all decide that we want to do these things. This is the voluntary act which starts the nervous system in operation. Impulses are set up in the brain and carried to the arm or foot by the nerves going to these parts. The impulses having arrived at the nerve endings in the arm or foot cause these muscles to contract (property of muscle tissue) and hence the part is moved. There are many other muscle functions such as those within the intestines, blood vessels, and heart which are totally automatic. These we will discuss as we go along. They function while the individual is awake or asleep and are those functions vital to life and personal well-being.

## 2. Explanation

### a. Anatomy

#### (1) Structure of nerves:

- (a) Neuroglia or supporting framework similar to connective tissue in other portions of the body.
- (b) Neuron - "nerve cell" - unit of structure.

- 1. Cell body--similar to other cells.
- 2. Processes

- a. Dendrite--usually short, may be long. Conduct impulses to the cell body.
- b. Axons--short or long. Carry impulses away from the cell body.

### 3. Classification of Neurons

- a. Structure--bipolar or multipolar.
- b. Function:

Afferent: carry impulses from receptor to central nervous system. Also called sensory.

Efferent: carry impulses from central nervous system to organ or effector. According to function called motor or secretory.

Internuncial: carry impulses from one section of central nervous system to another.

(2) Structure of nerve fibers: Chain or series of neurons. No continuity between the axon of one and the dendrite of the next. Region between called synapse. This synapse allows impulses to pass in only one direction, e.g. from axon to dendrite.

(3) Divisions of the nervous system:

(a) Brain--large, soft, grayish-white, irregular mass of nerve tissue. Extended in posterior portion to form the spinal cord.

1. Ventricles--describe briefly the location and connections with each other and the spinal canal. Formation of spinal fluid.

2. Areas of brain:

- a. Motor--precentral area
- b. Sensory--postcentral area
- c. Sight--occipital lobe
- d. Hearing--temporal lobe
- e. Speech--Brocas area in inferior frontal lobe.

3. Formation of spinal fluid--filtrate of blood through choroid plexus in the ventricles. Passes through ventricles and out around brain and spinal column.

4. Medulla--connects brain and spinal cord. Center of respiration.

5. Cerebellum--center of equilibrium. Has to do with coordination of body movements.

6. Cerebrum--where sensations are realized, recorded, entangled, and rerouted.

(b) Spinal cord--lies within vertebral canal. Extends from foramen magnum to between second and third lumbar vertebrae. Has nerves leaving and entering at intervals corresponding to vertebrae. Nerves carry impulses which are carried to the brain or relayed back from the spinal cord (reflexes).

(c) Protection to the central nervous system:

1. Boney--skull, vertebral canal
2. Meninges--dura, arachnoid, pia. Cover brain and spinal cord. Cerebrospinal fluid in sub arachnoid space.

(d) Cranio-spinal nerves:

1. Cranial--12 pairs leaving brain stem to pass out of the cranial vault. These nerves have highly specialized functions, e.g. II optic nerve, III oculomotor controls the eye movements, VIII the auditory nerve, etc.
2. Spinal nerves--31 pairs. Made up of motor and sensory fibers. Send nerves to all parts of the body. Govern the movements of extremities, trunk. Sensory nerves to skin. Secretory nerves to glands, etc.
3. Functions:

- a. Visceral afferent--from body viscera
- b. Visceral efferent--autonomic nervous system. Supply smooth muscle.
- c. Somatic afferent--exteroceptive and proprioceptive.
- d. Somatic efferent--supply striated muscle.

(e) Autonomic system (visceral efferent). That which supplies smooth muscles, e.g. heart, intestines, and glands.

1. Thoracolumbar or sympathetic--Prepare the body for alarm, exercise, emotional excitement, etc. Stimulates the heart, constricts the blood vessels, dilates the bronchi, dilates the coronary vessels.
2. Cranio-sacral or parasympathetic--in general antagonistic to sympathetic. Slows the heart, constricts the bronchi, dries secretions, dilates the vessels.

b. Physiology:

- (1) Irritability--property of all living tissue but more highly developed in nervous tissue. Measured as the length of time that stimulus must be applied before reaction takes place.
- (2) Conductivity--stimulus produces change which is

transferred. This transfer is known as nerve impulse.

(3) Nerve impulse:

- (a) Travel at definite speed. 100m/sec in man.
- (b) Refractory period--follows impulse. Nerve is at rest and will conduct no impulse no matter how strong the stimuli.

(4) Synapses--Exist at intervals between axons and dendrites:

- (a) Possess polarity
- (b) Offer resistance
- (c) Become fatigued--no impulses until recovery.  
Fatigue occurs first at synapse.

(5) Reflex arc--(See diagram). Chain over which impulses pass from receptor to central nervous system to effector. Whole nervous system may be thought to consist of such units.

- (a) Spinal cord reflexes--knee jerk; reaction to pain.
- (b) Medulla reflexes--vomiting; cessation of respiration during swallowing; heart rate; etc.
- (c) Cerebellar reflexes--those involved in locomotion and posture.
- (d) Cerebral reflexes--eye reflexes; association reflexes.

(6) Functions of spinal cord:

- (a) Reflex center for spinal reflexes.
- (b) Pathway for impulses to and from the brain.

(7) Functions of the brain:

- (a) Cranial nerve centers.
- (b) Hypothalamus--regulates body temperature, sleep, metabolism, autonomic nervous system.
- (c) Cerebral hemispheres--intelligence, sensations.
- (d) Location of function--covered.

(8) Conditioned reflexes. Reflexes which are acquired. These are the result of training, continued doing of the act or process.

3. Demonstration

a. TF 8-1393 "The Nervous System." American-Frohse charts and non-standard diagrams to be used freely with the lectures.

Training Notes:

1. Emphasize the following important points:
  - a. Properties of nervous tissue.
  - b. Structure of nerve cell.
  - c. Functional classification of neurons.
  - d. What is a synapse.
  - e. Gross anatomical divisions of the nervous system.
  - f. Areas of localization.
  - g. The meninges--their division and function.
  - h. Formation and location of spinal fluid.
  - i. Types of cranio spinal nerves.
  - j. Divisions of autonomic nervous system.
  - k. Brief discussion of physiology to include:
    - (1) Irritability and conductivity.
    - (2) The nerve impulse.
    - (3) Reflex arc.
    - (4) Functions of spinal cord.
    - (5) Functions of brain.
    - (6) Conditioned reflexes.

Tenth Period - Two Hours  
Special Senses

Place: Classroom

References: TM 8-220, Ch 2, Sec I; "Physiology and Anatomy," Greisham, Ch 8 and 9; "Textbook of Anatomy and Physiology," Kimber, Gray and Stackpole, Ch 23; "Textbook of Physiology," Best and Taylor; "Gray's Anatomy."

Instructional Aids:

Personnel: Instructor, one projectionist

Equipment: American Frohse charts; Non-standard diagrams; TF 8-1394; Blackboard and chalk; one projector, one screen.

Individual Equipment: Notebook and pencil.

24th and 25th Hours - Lecture, Conference, DemonstrationPoints to be Covered

## 1. Introduction:

- a. Certain groups of structures in the body are specifically

adapted for the reception of stimuli and the transformation of stimuli into sensations. These structures are called sensory mechanisms. The sensory mechanisms of the special senses are especially adapted for the reception of a particular type of stimulus. For example, the eye is adapted to the reception of light waves, and the ear designed for sound waves. There are five (5) special senses: sight, hearing, taste, smell, and feel. These five (5) sensations make us aware of our environment.

## 2. Explanation

### a. Sense of feeling

- (1) Location of reception. The receptors are located in the skin and subcutaneous tissue.
- (2) Structure. The receptors are either bare nerve endings (pain, heat and cold) or specialized receptor structures such as with the sense of pressure.
- (3) Function. Serves to pick up sensations of heat, cold, pain, and pressure.

### b. Sense of taste

- (1) Location of end organs (taste buds). These are located on the surface of the tongue at its base. The structures are called papillae.
- (2) Structure. This is a barrel-shaped cavity containing the nerve endings. The chemicals which stimulate the cells enter the taste bud.
- (3) Function. Chemicals within food stuffs stimulate taste bud cells. These are four (4) basic taste sensations: sweet, sour, bitter, and salty. All taste is a combination of two (2) or more of these.

### c. Sense of smell

- (1) Location of end organs. In the roof of the nose are free nerve endings.
- (2) Function. The gases and vapors from solids and liquids are inhaled and stimulate the nerve endings. Many foods which are eaten give off vapors which are inhaled. The sensation is one of taste but the mechanism actually operates through the nerves of smell.

### d. Sight

- (1) Location of end organs. The eye is located within the orbital cavity of the skull. The eye transmits the light to the actual receptor portion of the eye--the retina. This is the inner lining of the eye.
- (2) Structure. The eye is hollow, liquid filled spherical-shaped structure. The walls consist of three (3) tissue layers.

- (a) Sclera - outermost, fibrous layer.
- (b) Cornea - anterior, transparent portion of the sclera.
- (c) Choroid - Middle layer of the eye. Contains blood vessels.
- (d) Retina - the inner or third coat of the eye. Fibers of optic nerve arise here and the actual end organs of sight.
- (e) Lens - An elliptical, solid, transparent mass suspended within the eye and divides the eye into an anterior and posterior chamber. The lens can be changed in contour by means of extrinsic muscle attachments to converge or diverge light rays.
- (f) Aqueous humor - fluid content of anterior chamber.
- (g) Vitreous humor - a viscid, gelatinous transparent substance which fills the posterior chamber.
- (h) The Iris - A projection of muscle tissue which extends from the terminal portion of the choroid to cover the front of the lens. A defect or hole in the iris is called the "pupil." The size of the pupil varies with the contraction or relaxation of the radial muscles of the iris. The size of the pupil depends upon the amount of light necessary for clear vision and whether the usual object is close up or at a distance.
- (i) The conjunctiva. A transparent film of tissue lining the eye lids and reflected over the anterior portion of the orbit. This is a serous tissue and provides a moist surface for movement of the eye lids.
- (j) Lacrimal Glands (Tear Gland). Located in the lateral corner of the eye socket. Secrete tears which lubricate the conjunctival sac.

(3) Function. Light rays pass through the cornea and aqueous humor without much refraction. The light rays are refracted by the lens to be impinged on the retina at the point of central vision the fovea centralis. This gives detail to the visual object. Other light rays are scattered over the retina to give color, shade, and height and width to the visual object. In the retina light energy and the impulses set up are carried via the optic nerve to the sight center in the brain.

#### e. Hearing

- (1) Location of end organs. The actual end organs for hearing are within a bony shell in the inner ear contained in the temporal bone.
- (2) Structure

(a) External Ear

- 1. Pinna - external cartilaginous portion. Reflects sound waves to small extent.
- 2. External canal - External portion is cartilaginous and inner portion bony. Lined with hair and wax producing cells both of which help to keep canal clean.
- 3. Tympanum or Ear Drum. A tense glistening white membrane dividing the external canal from the middle ear.

(b) Middle Ear

- 1. Middle ear cavity. A hollowed out cave within the temporal bone. Separated from external ear by ear drum. Communicates with nasopharynx by means of the eustachian tube which maintains equalized pressure on either side of drum.
- 2. Ossicles. A series of three (3) very small linked bones which bridge the middle ear. These are attached to the tympanum on the lateral side and to another small membranous window of the inner ear. These three bones are the malleus (hammer), Incus (anvil), and the stapes (stirrup).

(c) Inner ear. Two (2) separate portions that associated with hearing is the cochlea. This is a hollowed out canal within the temporal bone. It is shaped as a snail shell. It is filled with a fluid called endolymph. Suspended in the endolymph are the nerve endings for hearing. The other structure of the middle ear is the semi-circular canals. These are three (3) hollow tubular organs arranged at right angles to each other and in three planes. These are also filled with endolymph. As the portion of the head changes in any plane, movement of the fluid in the canals sets up impulses which relay to the cerebrum bodily position.

- (3) Function. Sound waves pass through the external canal and set the ear drum into vibration. These vibrations are carried across the middle ear by the series of

linked bones. The small membrane of the inner ear at the base of the cochlea is set into synchronous movement with the tympanum. This small membrane acts as a diaphragm over a tube of liquid (the endolymph within the closed bony canal is the cochlea) and the vibrations are thus transmitted to the fluid medium. Vibrations within the endolymph are then picked up by the nerve receptors and nerve impulses are relayed to the brain where they are recorded as sound.

#### Training Notes

1. Stress the meaning of "special senses."
2. Stress the physiology of sight.
3. Stress the physiology of hearing.

#### Eleventh Period - Two Hours Endocrine Glands

Place: Classroom

References: "Physiology and Anatomy," Groisheimer, Ch 21; "Textbook of Anatomy and Physiology," Kimber, Gray and Stackpole, Ch 16; "Textbook of Physiology," Best and Taylor.

#### Instructional Aids:

Personnel: Instructor, one projectionist

Equipment: American Frohse charts; Non-standard diagrams; TF 8-1395; Blackboard and chalk; one projector, one screen.

Individual Equipment: Notebook and pencil

#### 26th and 27th Hours - Lecture, Conference and Demonstration

#### Points to be Covered

##### 1. Introduction

a. Definition: The endocrine glands or glands of internal secretion are scattered widely throughout the body. The glands have no secretory ducts. The secreting cells lie close to blood and lymph vessels. The secretion of each is poured directly into the blood stream.

b. Functions. The glands tend to regulate and correlate

bodily function. Each gland performs its own function, but, in addition, bears a relation to the other glands. Each gland produces one or more chemical substance called hormones which regulate some bodily process.

## 2. Explanation

### a. Islet Cells of the Pancreas:

- (1) Location - behind the stomach along posterior abdominal wall.
- (2) Function - production of insulin which regulates the amount of sugar within the blood. The amount of sugar depends upon the rate at which it is used up and existing bodily needs. Hypo function produces high blood sugar and diabetes. Hyperfunction produces reduced blood sugar with weakness, trembling, and perspiration.

### b. Thyroid Gland

- (1) Location - Anterior portion of neck in front of the trachia.
- (2) Function - regulates the bodily needs for oxygen. Liberates the active substance Thyroxin which depends upon intake of iodine. Overgrowth of gland is called goiter. Hypo function produces slowing of mental activity and reduction of bodily processes. Hyperfunction produces increased metabolism and speeding up of normal body activity.

### c. Parathyroid Glands

- (1) Location - Four small glands at the posterior surface of the thyroid.
- (2) Function - Regulate the level of calcium in the blood stream and bone.

### d. Suprarenal or Adrenal Glands

- (1) Location - overlie the upper pole of the kidneys.
- (2) Function - The gland itself shows two structural and functional portions. The medulla produces adrenalin which regulates the heart rate and blood pressure. Adrenalin is the substance which prepares the body for alarm and quick, ready action. The cortex produces a number of complex substances which have various effects. They influence carbohydrate metabolism, sexual development, salt content, etc.

### e. The Pituitary Gland

- (1) Location - lies within the skull beneath the brain. Protected by the sella turcica.
- (2) Function: Here again the gland has two structural and functional parts. The anterior lobe secretes a number of hormones which regulate:
  - (a) Body growth
  - (b) Thyroid activity.
  - (c) Gonad activity
  - (d) Adrenal gland
  - (e) Mammary glands - The posterior lobe regulates the rate of urine formation and the tone of smooth muscles in the blood vessels, intestinal tract and uterus.

f. Gonads

(1) Location

- (a) Female (ovaries) within the pelvis.
- (b) Male (Testicles) within the scrotum.

(2) Function

- (a) Female - produce ova. Produce sex hormones which regulate sexual development.
- (b) Male - Produce sperm. Produce testosterone which is male sex hormone. This regulates male sexual development and function.

Training Notes:

1. Stress interactivity of various endocrine glands.
2. Stress location and general function of the endocrine glands.

Twelfth Period - Two Hours  
Surface Anatomy and Its Importance

Place: Classroom

References: All previous references

Instructional Aids:

Personnel: Instructor

Equipment: Non-standard diagrams; American-Frohse charts; Blackboard and chalk; Skin pencil

Individual Equipment: Notobook and pencil

## 28th and 29th Hours - Lecture, Conference, Demonstration

### Points to be Covered

#### 1. Introduction

a. It is important from the doctor's point of view in diagnosing various ailments to be able to relate the internal organs of the body to the body surface. But why should this interest you? First from the standpoint of simple curiosity. Now most of you have a general understanding of the location of different organs as a matter of common knowledge. Secondly as technicians you are going to be called upon to treat various injuries. If these are penetrating injuries it is well to know what underlying structures are most probably damaged. Then in your work on the wards you are going to be called upon to prepare patients for various types of operations. Here again you must have a conception of what you are trying to accomplish before setting about to do it.

#### 2. Explanation: This is to be mainly demonstration but is to include the following points:

##### a. Skull

- (1) Location of sinuses.
- (2) Location of mastoid cells.
- (3) Area in which a cisternal puncture is done.

##### b. Neck

- (1) Thyroid gland
- (2) Direction of carotid artery and compression point against transverse process of 6th cervical vertebra.

##### c. Thorax

- (1) Outline of lung fields.
- (2) Outline of heart.
- (3) Areas of liver.
- (4) Area of spleen.
- (5) Upper limits of kidneys, especially on the left.

##### d. Abdomen

- (1) Division of abdomen into quadrants.
- (2) General location of organs:

- (a) Liver
- (b) Stomach
- (c) Large intestine
- (d) Appendix
- (e) Kidneys

## 3. Demonstration

a. To be done with subject. With aid of skin pencil an outline of internal organs is to be made. Non-standard diagrams utilized.

Training Notes

1. Stress location of general areas on body.
2. Stress location of organs in relation to general areas of body.



COMMANDANT'S ORIENTATION

(2)

PERIOD	HOURS	WEEK	SUBJECT
1	1	1	Commandant's Orientation
1	1		<b>TOTAL</b>

1. Purpose and Scope: To permit the Commandant to acquaint the students with the type and purpose of training they will receive, and also to orient them concerning the regulations and facilities of the post.

2. Standard of Proficiency: That students are familiar with the local policies and regulations which govern them, and are informed of the moral, physical, mental, and recreational facilities available to them on the post.

3. Basic References: "Post Regulations," Fort Sam Houston, Texas; Index to Lesson Plans; Information and Policy Memoranda.

First Period - One Hour  
Commandant's Orientation

Place: Theater No. 4 or Outdoor Area

References: "Post Regulations," Fort Sam Houston, Texas; Index to Lesson Plans; Information and Policy Memoranda.

Instructional Aids:

Personnel: The Commandant

Equipment: National and School Colors

Individual Equipment: None

1st Hour - Conference

Points to be Covered:

1. Courses available at the School.
2. Nature of the subject matter covered in the training programs.
3. Purpose for taking this training, especially now that hostilities have ceased.
4. Policies which will govern and affect them as individuals.

5. Pertinent Post Regulations.

6. Inform the students of the nature of facilities available to them at this post.

1. Purpose: The ten (10) hours allocated as Commander's Time within the course are intended to provide time for additional instruction in prescribed subjects and to compensate for unavoidable interruptions in the course.

2. Training Notes:

a. Training time lost due to unavoidable interruptions will be made up promptly by use of the time allocated to the commander and the minimum amount of off-duty time as may be required to complete the course in the prescribed period.

b. Individuals who are found deficient generally or in specific subjects will be given additional instruction in off-duty hours so that the prescribed training may be completed within the training period.

c. It is not intended, except in emergencies, that Commander's Time be allocated for processing or similar administrative or supply procedures.

d. Training officers will show Commander's Time on the Weekly Training Schedule and will indicate in parentheses immediately thereafter the subjects to be scheduled.



EMERGENCY MEDICAL TREATMENT

(4)

PERIOD	HOURS	WEEK	SUBJECT
1	1	2	Introduction
2	2	2	Classification of Wounds
3	2	2	Care of Wounds
4	4	3	Fractures
5	2	4	Hemorrhage
6	2	5	Shock
7	1	5	Acute Inflammation
8	2	6	Strains, Sprains, and Dislocations
9	2	6	Other Kinds of Injuries
10	1	6	Face and Jaw Wounds; Unconsciousness
11	2	6	Burns
12	1	6	Chest Wounds
13	2	7	Injuries Due to Heat and Cold
14	1	8	Asphyxia
15	2	8	Artificial Respiration
16	1	8	Blood Groups and Plasma
17	1	8	Transfusion and Intravenous Therapy
18	1	8	Abdominal Wounds
19	1	8	Use of Plasma and Blood Substitutes
20	1	8	Classification and Care of Wounds (Review)
20	32		TOTAL

1. Purpose and Scope:

a. One of the most important of the many duties of the medical soldier is to render emergency medical treatment. The welfare of a wounded patient always depends to some extent on the efficiency of the emergency care he was given at the time his injury was received. It is the purpose of this course to provide sufficient instruction in emergency treatment to enable the student to render aid to the best advantage of the patient.

b. The course should include instruction in the classification and care of wounds; the emergency treatment of different types of fractures, strains, sprains and dislocations; control of hemorrhage; emergency treatment of acute inflammation, animal and insect bites, face and jaw wounds, unconsciousness, burns, chest and abdominal wounds, injuries due to heat and cold and asphyxia. It should also include classes of instruction in blood transfusion and use of plasma and blood substitutes.

2. Standard of Proficiency: At completion of this course each student should:

a. Be able to identify different types of wounds and know the emergency treatment thereof.

b. Be sufficiently versed in emergency measures to efficiently give first aid in most emergency conditions which may be encountered inside or outside the hospital.

3. Basic References: FM 8-50, 21-10, 21-11; TM 8-220; "Textbook of Medicine," Cecil; "Textbook of Surgery," Christopher; "Physiology and Anatomy," Greishamer; "Surgical Nursing," Eliason, Ferguson, Farrand.

First Period - One Hour  
Introduction

Place: Lecture Hall

References: FM 21-11, Par 2, 5, 7; TM 8-220, Par 139.

Instructional Aids:

Personnel: One Instructor

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

1st Hour - Lecture

Points to be Covered

## 1. Introduction:

a. This course is named Emergency Medical Treatment and deals with those emergencies which you may meet in the field, hospital, or civilian life. As medical and surgical technicians you must be prepared to handle and treat all types of injuries. In order to do so you must acquire knowledge as to diagnosis of injuries and treatment.

## 2. Scope:

a. In this course you will be primarily interested in the care of the sick and wounded. You will have 32 hours of instruction consisting of lectures, demonstrations, and application. The courses that will be covered are classification of wounds, treatment of wounds, shock, hemorrhage, inflammation, fractures, burns, asphyxia, and other types of injuries.

## 3. Mission:

a. What is your mission as Medical Department Soldiers? It is that of the entire Medical Department - "To preserve the Fighting Strength of the Armed Force." And how is this accomplished and what does it mean? It means cutting down or reducing the number of man power days lost to the army. This is accomplished first by preventative measures such as inoculations or immunizations; inspections of personnel, mess halls, latrines, etc; and quarantines. It is accomplished by prompt, efficient care of the sick and of the wounded.

## 4. Definitions:

a. First aid is the immediate temporary measures given by untrained soldiers or civilians in the case of an accident or sudden illness.

b. Emergency Medical Treatment is the immediate temporary treatment given by a trained Medical Department Soldier or Medical Officer.

c. Diagnosis: In order to be able to treat these emergencies you must first be able to recognize them or diagnose them. What is diagnosis? It is the recognition of a disease or injury by its signs and symptoms. In the army it includes the time and place of the injury, the cause, the location of the body and what the line of duty is.

d. By signs and symptoms we mean the unusual sensations experienced by the patient and what changes we can see in the normal physical structure of the body.

(1) Signs are objective indications of abnormalities which may be felt, seen, smelled or heard. They

are things apparent to the observer. Examples: Muscular spasm; fever; perspiration; skin rashes.

- (2) Symptoms are subjective and are experienced by the patient. They are abnormalities felt by the patient and told to the examiner. Examples: Pain; chills; appetite; nausea.
- (3) Diagnosis: Diagnosis not only includes careful evaluation of the signs and symptoms but also of the history of the case, the physical examination, and laboratory data.

e. History includes:

- (1) Present illness
- (2) Past and Family History
- (3) Habits
- (4) Previous injuries
- (5) Military History

f. Physical Exam - Complete physical examination

g. Laboratory Data

- (1) Blood tests
- (2) Urinalysis
- (3) Blood chemistry
- (4) Special tests

5. General Rules of Emergency Medical Treatment

a. Remain calm - work with assurance. You have to know what you are doing in order to do it. Don't loose your head.

b. Keep the patient calm. If you are calm and assured the patient will have confidence in you. Reassure the patient.

c. Casually keep the patient from seeing the wound or injury as you are taking care of it.

d. Send for Medical Officer. You are giving temporary treatment only. Definitive treatment must be started by a doctor.

e. Keep bystanders away - that's a job in itself. Appointing one (1) or two (2) of the ones that get in your hair to help in this will keep them out of the way and also help keep other people back.

f. Do not move the patient until the extent of injury has been determined.

g. Diagnose the injury and then give proper emergency medical treatment and prepare for evacuation.

h. Always treat the most serious injury first - stop hemorrhage - treat asphyxia - treat shock - etc.

Training Notes:

1. Emphasize the role of the Medical Department Soldier in administering emergency treatment.
2. Emphasize the importance of proper emergency treatment in determining the outcome of a wound.
3. Stress general rules of Emergency Medical Treatment.

Second Period - Two Hours  
Classification of Wounds

Place: Lecture Hall

References: FM 21-11, pars 2, 5, 7; TM 8-220, par 139; TB Med 116.

Instructional Aids:

Personnel: One instructor; one man to assist in demonstration.

Equipment: Blackboard; Charts; Moulages

Individual Equipment: Notebook and pencil

2d and 3rd Hours - Lecture, Conference, Demonstration

Points to be Covered

1. / Definition:

a. A wound is an injury in which the continuity of the skin, mucous membranes or deeper structures of the body are broken. It is usually thought of as a break in the skin or mucous membrane.

2. Types of Wounds

a. Aseptic or clean wound. This is a wound in which there are no bacteria present. The only wounds of this type are those made under operating room conditions.

b. Contaminated wounds. A contaminated wound is one in which bacteria are present in a resting stage. All accidental wounds are contaminated wounds. Bacteria once present in a wound will grow and produce toxins which further damage tissue. The more damaged tissue present, the better their chance to multiply. A wound with little damage to tissue can combat the bacterial invasion; damaged tissue cannot. There are six to eight hours of incubation before they invade.

c. Infected wound--a wound in which the bacteria have already invaded the tissues. The body combats this infection by use of white blood cells--these are killed and make up the greatest parts of the pus. An infected wound results from a contaminated wound when the bacteria have not been removed, or killed, or overcome by defenses of the body. Then two (2) types of wounds are the most important because a contaminated wound properly treated will not become an infected wound, and infected wounds cause more liability and loss of man power in the army than any other type of wound.

d. Poisoned wound is a wound in which some type of poison other than bacterial is present. May be snake venom, insect venom, or some chemicals as various analine dyes, phenol, etc.

### 3. Classification of Wounds -- Classified as to the appearance of the wound and the mechanical cause of the wound.

a. Contusion - this is an injury to the deeper structure without a break in the skin. It is caused by a blow with some type of blunt instrument or by a fall. An example is the simple bruise. In a contusion there is a disruption of cells deep under the skin--the blood vessels are usually torn and damaged resulting in a bleeding into the tissues. If the bleeding is severe (large vessels damaged) the wound can be dangerous because of pressure of the blood causing further damage. Infection must be guarded against but as skin is intact it is not so dangerous.

b. Abrasions - Brush burn - Here the superficial layer of skin is ground off and usually foreign particles are ground into the deep layers. It is a contaminated wound and must be handled as such.

c. Incised Wound - one in which a sharp instrument such as knife, glass, sharp metal objects, etc, cut through skin into deep structures. These usually are fairly clean with little contamination. This is due to two (2) things:

- (1) The sharp instrument carries very little dirt with it.
- (2) There is profuse bleeding which helps remove the bacteria carried into the wound.

However, remember that all accidental wounds are contaminated and this no exception. Hemorrhage is important in this type of wound.

d. Lacerated Wound - this type is caused by tearing of the tissue by rough instruments, jagged metal, shrapnel, etc. It is a rough ragged wound with irregular edges to skin. There is a great deal of tissue damage due to mechanisms of the wound. There may be large amounts of dirt or other foreign particles ground into the wound. Due to the crushing and tearing of the blood vessels there is very little bleeding. The danger of infection is very great as these are deep,

badly contaminated wounds.

c. Puncture, penetrating, perforating. These are all about the same. They are caused by a penetrating instrument as nail, knife, and bullet. The wound is very deep and narrow. Again these are contaminated wounds. Also they are deep wounds that may have damaged some of the internal organs and deep structures. Due to narrowness of the opening the external bleeding may be small. Remember that a wound may be any one of these types or may be a combination--for example a contused wound. Here the injury is due to a blow but the skin is broken. There is a great deal of damaged tissue and the infection potential is high.

4. There are three (3) chief dangers from wounds. These will be covered fully at later periods. They are hemorrhage, shock, and infection.

a. Hemorrhage - first thing to treat and control is a wound. Hemorrhage can cause death very rapidly so control it. Pressure directly at site of bleeding is easiest and best method, but use a sterile dressing.

b. Shock - next to hemorrhage, shock is most important in the immediate treatment. Control their pain, give warmth, I.V. fluid if available.

c. Infection - All accidental wounds are contaminated and must be treated as such. Where possible bacteria should be removed or killed before six to eight hour period is up. This is not possible under ordinary field conditions; has to be done in some type of surgery. The important thing in the field is to prevent further contamination and evacuate so that definitive treatment can be started.

## 5. Treatment of Wounds

a. The things for you to remember in treating a wound are:

- (1) Do nothing that may add further damage to the wound.
- (2) Keep further bacteria out of the wound.
- (3) All receive tetanus toxoid and gas gangrene anti-toxin.

b. Contusion - ice, or cold packs initially to stop the bleeding and the hot packs to dilate the vessels and aid in absorption of the blood. If hemorrhage has been large, aspiration under rigid aseptic technique may be necessary.

c. Laceration - In the field general measures of controlling bleeding and sterile dressing. In hospital the skin is cleaned with soap and water and antiseptic applied. Wound then irrigated with water (NaCl) and if very dirty may be gently washed with neutral soap. If

wound is under six to eight hours old it is then sutured. Tetanus toxoid and gas gangrene antitoxin given - Penicillin may be started also as a preventive measure.

d. Lacerated Wound. Field treatment is the same. In hospital it is irrigated and washed and debridement done--all devitalized tissue removed surgically. If small and under six to eight hours old it is sutured--if large or deep it may be packed open for drainage. Greatest danger is from gas gangrene which grows in depth of deep muscle wounds--so it is left open to air. Penicillin given to prevent infection.

e. Contused Wound. Same as laceration, dead and damaged tissue removed.

f. Abrasions. Cleaned with soap and water gently and left dry --no strong antiseptic as it causes tissue damage.

6. Demonstration: Demonstrate appearance of different types of wounds by use of moulages in conjunction with lecture and conference.

#### Training Notes:

1. Stress the dangers of accidental wounds.
2. Emphasize the emergency care of various types of wounds.

#### Third Period - Two Hours Care of Wounds

#### Place: Classroom

References: FM 21-10 par 114-115; FM 21-11 par 6-9; FM 8-50 pp 1-40, 42, 43; TM 8-220 par 140, 141, Soc II. TB Med 116; TB Med 147.

#### Instructional Aids:

Personnel: One demonstration group for each platoon.  
One instructor each platoon.

Equipment: Wound moulages; one 1", one 2", and one 3" roller bandages; two triangular bandages; old and new first aid packets. One set of the above to each demonstration team. Charts.

Individual Equipment: Notebook and pencil

#### 4th and 5th Hours - Conference, Demonstration

#### Points to be Covered

## 1. Introduction:

a. Many wounds are not dangerous to life in themselves, but unless they are properly cared for complications which would make them dangerous may arise. In a hospital the medications which are to be used on wounds will be prescribed by the medical officer, but the technician may be required to change dressings. When a technician encounters an injured man in the field, he will need to apply dressings and splints. This period of instruction will deal with dressings and splints.

## 2. Explanation and Demonstration:

a. Barton's head bandages -- this is the bandage of greatest practical use in wounds of the scalp; wounds of the side of the face; jaw wounds and broken jaw. (Demonstrate)

b. Triangle of forehead or scalp - good in head and scalp injuries. (Demonstrate)

c. Recurrent bandage of head with one or two bandages. (Demonstrate)

d. Shoulder spica (Demonstrate)

e. Arm sling (Demonstrate)

f. Figure-of-eight of clavicle (Demonstrate)

g. Spiral bandages of arm and leg (Demonstrate)

h. Air tight dressing for chest wounds.

i. Dressings for large abdominal wounds.

### Training Notes:

1. Explain carefully the purpose of each type of bandage as it is demonstrated.

2. Stress applying bandages so they are neat, firm, comfortable.

### Fourth Period - Four Hours Fractures

Place: Lecture Hall; Demonstration classroom

References: FM 21-11 par 118-120; FM 21-11 Sec II; TM 8-220 par 149-150; FM 8-50 pp 40, 44, 65; TB Med 22; "Textbook of Surgery," Christopher.

Instructional Aids:

Personnel: One officer as lecturer. One demonstration group for each platoon. One instructor each platoon.

Equipment: Charts; Skeleton; Plaster Moulages; One Field Splint Set; 2 wire ladder splints; one stretcher; three blankets; eight triangular bandages; three 3" roller bandages.

Individual Equipment: Notebook and pencil

6th, 7th, 8th and 9th Hours - Lecture, Demonstration

Points to be Covered

1. Explanation (Two hours)

a. Introduction:

(1) Fracture is the most common injury seen in the field. These will occur in peace time maneuvers as well as in war time. It is therefore of extreme importance that you become familiar with all types of fractures and with how to handle them.

b. Definition:

(1) A fracture is a break in the continuity of a bone. It is not necessary that the fragments be separated. In many fractures the bone may be only "cracked."  
(2) And what is the difference between a "broken" bone and a fractured bone? None. Fracture is a technical term and broken is a lay term.

c. General Classification:

(1) Simple fracture: In this type of fracture there is a break in the bone but no communication between the bone and the exterior surface of the skin. The bone may be badly splintered but so long as the skin is not broken it is a simple fracture.

(2) Compound fracture: In this type there is direct communication of the fracture with the exterior surface of the skin. A bone fragment may protrude through the skin, or there may be a wound channel, such as produced by a bullet or shrapnel fragment, which extends from the surface of the skin down to the break in the bone. This latter type is the type most commonly seen in battle casualties, 30% of all battle casualties,

resulting from gunshot wounds in the experience of the army were compound fractures. The mortality in this type of injury should be low if these men are given prompt first aid treatment and proper measures taken to prevent shock and infection. It is in this type of wound that debridement is so essential to prevent infection and early evacuation of these patients is one of the chief aims of the first aid man.

d. Classification of Fractures with Regard to Position, Number, and Shape of Bone Fragments:

- (1) Transverse: A break into two fragments which is usually in a straight line, more or less at right angles to the long axis of the bone.
- (2) Spiral: Two fragments, but the break line is in a spiral or S shape. These are produced by twisting injuries as seen among ski troops, or by torsion produced by muscular contraction.
- (3) Serrated: Two fragments broken with a saw-tooth edge along the break line. This may catch muscle tissue in the reduction.
- (4) Comminuted: Three or more fragments resulting from the break.
- (5) Impacted: The broken ends are jammed together so that they more or less telescope each other.
- (6) Greenstick: An incomplete break of the bone usually resulting in the convex surface breaking while the concave surface remains intact. This is seen more commonly in children in whom the bones are more elastic.
- (7) Depressed Fractures: This type occurs in flat bones such as the skull. A fragment is driven below the normal surface of the bone.
- (8) Longitudinal: The fracture line is parallel to the long axis of the bone.
- (9) Pathological: This is a fracture which is the result of disease in the bone. The bone being so weakened that a slight amount of force will produce a fracture. This type is found in older people. The most common disease is cancer where the condition has spread from some other organ.
- (10) Multiple: This is a condition where there are two or more fractures involving the same bone.
- (11) Complicated: Any of these above mentioned types plus injury to vital structures such as nerves and arteries.
- (12) Oblique: Break runs at an angle.

e. Steps in the Healing of Fractures

- (1) Break in the continuity of the bone.
- (2) Hemorrhage around the ends of bone and in damaged tissue; this then forms a clot at the site of the fracture.
- (3) Chemical Changes: The damaged tissue then causes an acid reaction in the clot which tends to dissolve some of the calcium from the ends of the bone.
- (4) Deposition of Calcium: As the healing process starts small blood vessels grow into the clot so that the old blood and tissue fluids are removed and the reaction of the clot becomes alkaline. This causes the dissolved calcium to be precipitated as a hard mass which is called the callous.
- (5) Connective tissue from the bone and from soft tissue grows into the mass and bridge the gap. Osteoblastic cells from the periosteum grow and form new bone by utilizing the calcium in the callous.
- (6) The callous is then absorbed.

f. Symptoms of Fracture:

- (1) The patient frequently feels or hears the bone snap.
- (2) Pain and tenderness at the point of the break.
- (3) Deformity in some cases.
- (4) Partial or complete loss of motion is often present in adjacent joints.
- (5) Swelling and discoloration. This can be used as a measure of the amount of tissue damaged.
- (6) Crepitus or grating may be felt (although attempts to obtain this sign should not be made).
- (7) Shock
- (8) In compound fracture a bone fragment may protrude through the skin, or there may be a wound channel extending down to the bone. The bone may not be visible at the base of the wound.
- (9) Symptoms in Special Types of fractures.
  - (a) Fracture of the skull: Unconsciousness, swelling or laceration of scalp, bleeding or leakage of spinal fluid from nose, mouth, or ears, difference in size of pupils, blackening of tissues under the eyes, changes in pulse and respiration, paralysis or twitching of muscles.
  - (b) Fracture of the spine: Pain or deformity at the site of fracture. If the spinal cord is injured there may be paralysis or loss of sensation below the site of the fracture. Loss of control of bladder and bowel.
  - (c) Fracture of lower jaw: Pain on movement of jaw, irregularity of teeth, inability to swallow or

talk in some cases. Bleeding and drooling of saliva from the mouth. In cases of bilateral fracture, the soft tissues may drop back and strangle the patient and one of the most important things in treatment is to clear the upper air passages by airway or traction on the jaw.

- (d) Fracture of the clavicle: Injured shoulder is at lower level than uninjured. Patient unable to raise arm above shoulder and supports elbow with hand of sound limb. Fractured ends can usually be felt.
- (e) Fracture of Rib: Pain especially on breathing or coughing. The broken rib is tender and hard pressure over the sternum produces pain at the site of the fracture. The break can be felt sometimes.

#### g. First Aid treatment of fractures

##### (1) General rules of treatment

- (a) Splint them where they lie. By handling one may make a simple fracture compound, a compound may be further aggravated, or pathogenic bacteria may be introduced into the wound.
- (b) Control hemorrhage if present.
- (c) Treat shock.
- (d) Treat pain with morphine unless contraindicated.
- (e) Dress wound.
- (f) Pad bony prominences.
- (g) In applying splints first apply sufficient traction to the extremity to restore proper alignment and be sure the splint extends beyond the joints above and below the fracture.
- (h) Tetanus anti-toxin and gas gangrene antitoxin are necessary in compound fractures.
- (i) Evacuate as soon as possible.

##### (2) Cautions:

- (a) Don't move until splinted.
- (b) Don't make splints or dressings too tight.

#### 2. Demonstration: (Two hours)

- a. Demonstrate application of the army leg splint.
- b. Demonstrate emergency measures for specific fractures:

- (1) Clavicle: Figure of eight bandage around shoulders, crossing over spine; pillow between shoulder blades; sling at the wrist.
- (2) Hand and Fingers: Roller bandage in palm; plaster moulded--banjo splint with traction.
- (3) Wrist and Forearm: Padded basswood splints with full arm sling. Plan to apply plaster cast.
- (4) Elbow: Ladder splint bent and fitted to posterior side of arm.
- (5) Upper arm: Chest pad between chest and humerus with double sling or valpeau type bandage. A well padded external splint helps to immobilize the part. Army splint is no longer used.
- (6) Ribs: Immobilize with a tight bandage.
- (7) Pelvis: Strap legs together and bandage pelvis, move gently.
- (8) Tibia and Fibula: Ladder splint; Board splints well padded; Pillow splint.
- (9) Ankle and Foot: Wiro ladder splint or plaster cast from ankle to knee.
- (10) Back and neck: Lie on back on stretcher in hyper-extension with blanket under back or cotton roll under neck.
- (11) Femur: Army leg splint; Thomas splint.
- (12) Knee joint: Army leg splint with knee flexed at 20 to 30 degree angle.

Training Notes:

1. Stress careful handling of fractured part.
2. Emphasize immobilization of part before moving.
3. Emphasize maintaining constant traction once traction is applied.

Fifth Period - Two Hours  
Hemorrhage

Place: Classroom

References: FM 21-10 par 116; FM 21-11 Sec II; TM 8-220 par 143.

Instructional Aids:

Personnel: One lecturer, one demonstrator, each platoon

Equipment: Charts; blackboard; first aid packets; bandages; tourniquet.

Individual Equipment: Notebook and pencil

10th and 11th Hours - Conference, DemonstrationPoints to be Covered**1. Conference**

a. Definition - Hemorrhage is the escape of blood from the arteries, veins or capillaries of the body. Bleeding may occur in small or large amounts. It may be internal or external. It is actually the flow of blood from any part of the body.

**b. Types of Hemorrhage:**

- (1) Arterial - the most dangerous type of hemorrhage because of the rapid loss of blood which occurs. This is because arterial pressure is higher than that in the veins and capillaries. The blood is bright red because of the oxygen content. The flow is rapid and comes out in "gushes" of "spurts" which correspond to the heart beat. There are three types of arterial hemorrhage which bear a definite relationship to the time of injury:
  - (a) Primary - occurs immediately following injury. This is the most common type.
  - (b) Intermediate - occurs sometime after the primary hemorrhage is stopped. It may be due to a rise in blood pressure following stimulants or a transfusion. It may follow the mechanical dislodging of a clot due to movement of the part or rough treatment of the wound.
  - (c) Secondary - this may occur days after injury. It most commonly occurs when a ligature slips (explain ligature) or when an infectious process erodes the vessel wall.
- (2) Venous - Usually less serious than the arterial type. May be serious when a large vein such as the femoral, brachial or jugular is involved. More easily controlled than arterial. The pressure is lower than in the arteries. The flow is slower and constant due to the relatively constant pressure in the veins. The color is bluish-red due to the depletion of the oxygen content.
- (3) Capillary - This is the least serious type because of the slow rate of flow and is usually easily controlled by pressure. The rate of flow is best described as an "ooze." It is slow but can become dangerous unless controlled. The color is a little darker red than the

arterial type because some of the oxygen content has been lost.

c. Control of hemorrhage - control measures may be natural or mechanical or a combination of the two.

- (1) Natural - hemorrhage stops when blood pressure has been lowered enough to allow a clot to form. (Example: nosebleed of a hypertensive person, where the vessels of the nose act as a "pop-off" valve.) Clot formation is easy in a lacerated wound; difficult in an incised wound.
- (2) Mechanical - most all hemorrhages can be controlled by application of a firm dressing. In some cases where a large artery is involved more stringent measures must be taken, such as ligature or tourniquet. One of the most effective means is by correct pressure points. There are seven (?) points in the body where an artery can be compressed against the bone or firm tissues to occlude the artery.
  - (a) Temporal - 3 fingers on a line between the external canal of the ear and the outer corner of the eye.
  - (b) Facial - a point about one inch anterior to the angle of the mandible and along the inferior border of that bone.
  - (c) Carotid - lateral to thyroid cartilage. Compress only one carotid at a time because of the carotid sinus reflex.
  - (d) Subclavian - located below the clavicle at the lateral portion of the inner 1/3. Vessel may be compressed against a rib.
  - (e) Brachial - middle third, upper arm, medial surface, posterior to biceps muscle.
  - (f) Femoral - a hand's breadth below the groin in the middle of the upper thigh. A great deal of pressure required.
  - (g) Popliteal - located just behind the knee.

## 2. Demonstration

a. Pressure points. List all points and point out on anatomical chart. Then illustrate on living subject.

b. Pressure dressings. Explain importance in controlling hemorrhage by this method and demonstrate application.

c. Tourniquet: Show proper application. Dangers of using a tourniquet.

- (1) Gangrene - left on too long.
- (2) Hemorrhage because too loose.
- (3) Loosening tourniquet may cause more bleeding.
- (4) Always tag as to time tourniquet put on.

Training Notes:

1. Stress control of hemorrhage by direct pressure.
2. Emphasize dangers in the use of a tourniquet.

Sixth Period - Two Hours

Shock

Place: Classroom

References: TM 8-220 par 144; FM 21-10 par 117; "Physiology," Best and Taylor.

Instructional Aids:

Personnel: One lecturer; One demonstration team group for each platoon

Equipment: Blackboard; Hand litter; blankets; hot water bottles.

Individual Equipment: Notebook and pencil

12th and 13th Hours - Conference, Demonstration

Points to be Covered

1. Definition:

a. Shock is a profound depression of all mental and physical processes of the body. It is due to a decrease in the circulating blood volume with a resulting anoxia (lack of oxygen in the tissues). It is usually the result of injury or severe bleeding. It is collapse or failure of the peripheral circulatory system.

2. Types of shock:

a. Neurogenic: It is a nervous reaction to some type of stimuli. Sudden nervous shock as bad news, fear, excitement can cause it. The reaction causes a vasoconstriction of the peripheral and cerebral (brain) vessels with a resulting anoxia. The patient's loose consciousness. Example of this type is the common syncope of fainting which is a very mild form. It may vary from this to severe shock with all the symptoms of severe shock.

b. Traumatic shock: This is the most common type seen in the army. It follows any type of trauma to the body as crushing injuries, bullet wounds, fractures, etc. When the injury is accompanied by loss of blood the shock comes on more rapidly.

### 3. Mechanism of shock:

a. There are two main theories as to the mechanism of shock. Which one is right is not known but probably it is due to a combination of both with a neurogenic element as well. Both theories agree as to what happens to the circulation but disagree as to what causes it. In shock there is a vasoconstriction of the peripheral vessels with a dilatation of the vessels in the skeletal muscles and in the abdomen.

b. This nervous part of the circulating volume of blood from circulation causing a decrease in the amount of  $O_2$  going to the tissue. This lack of  $O_2$  damages the capillary vessels so that the liquid element of the blood is lost into the tissue. This slows the circulation still more - the blood becomes thick as the cells are retained. Result is more anoxia - more damage - more shock. Thus a vicious cycle is set up. Heart doesn't get normal amount of blood to pump so pumps faster but puts out smaller volume. And what starts this mechanism or vicious cycle? One theory says that the injured tissue liberates a toxin that initially damages the capillaries so that the plasma is lost. Another says that there is local loss of plasma into the damaged tissue and that this amount lost is large enough to decrease the blood volume and thus start the anoxia that causes the damage. There also is probably a neurogenic element in most cases which may aid in starting the cycle.

### 4. Symptoms of shock:

a. Drowsiness - usually wholly unconscious - has diminished sensitivity to pain.

b. Appearance - pallor - frequently slight cyanosis of lips, nails and ears.

c. Skin - cold clammy, most commonly cold sweat of forehead.

d. Pulse - rapid and weak - because of the diminished blood supply heart is working faster to make up for it.

e. Blood pressure - lowered because of the decrease in blood volume.

f. Superficial veins are empty.

g. Nausea and vomiting are present.

### 5. Treatment of shock:

a. Heat: Enough to make the person comfortable. May be applied by hot water bottles or rocks, heated or latern under cot or in a blanket tent. Don't burn the patient. Also don't overheat him. Blood volume is already low and fluid loss by excessive sweating will lower it more.

b. Trendelenberg position - decrease the cerebral anoxia and aids in increase of cardiac output.

c. Stimulants: aromatic spirits of ammonia. 1 tsp in  $\frac{1}{2}$  glass of water; coffee, tea help due to their caffeine content; Caffeine Sodium Benzoate can be used; Adrenalin has been used but it has very short action and leaves the patient worse than he was.

d. Morphine - use only for relief of pain. Remember in giving it to shocked patient that the circulation is very poor. If given subcutaneously or intramuscularly it may simply form a little pool in the tissue and not be picked up. The patient may remain in pain and additional doses given - finally when the circulation does pick up all of the morphine is picked up at once and morphine poisoning results. So watch it. Also it may depress patients more than they are already depressed by shock.

e. Oxygen increases the concentration of  $O_2$  in the red cells. This helps to decrease the anoxia.

f. Plasma - restores the blood volume - it is the fluid part of the blood that has been lost in the tissues. If you restore the blood volume, you can overcome the anoxia and break the cycle of shock. It is the most important part in the treatment of shock.

g. Other fluids - other types of fluid can be used but most are only of temporary value as they are very rapidly lost from the vessel into the tissues. Normal saline or 5% glucose in  $H_2O$  are the most used. Blood can also be used and is especially good where there has been hemorrhage.

## 6. Demonstration

a. Demonstrate shock litter with patient.

(1) Position:

- (a) If conscious, on his back with head and shoulders lower than legs and hips.
- (b) If unconscious, keep him face down, with his head turned to one side, and with his head and shoulders lower than his legs and hips.

(2) Warmth:

- (a) Ordinarily, simply cover him with extra clothing or blankets.
- (b) If weather is cold, apply heat by means of hot water bottles, warm stones or bricks, canteens filled with hot water. These warm objects should be covered or placed between blankets and should not be put against bare skin or against very thin clothing because they may burn the person. They may be placed under the arms, between the legs, or beside the waist.

Training Notes:

1. Emphasize shock position.
2. Emphasize keeping shock patient comfortably warm but not overheating him.

Seventh Period - One Hour  
Acute Inflammation

Place: Classroom

References: "Physiology and Anatomy," Griesheimer, Ch 10; "Surgical Nursing," Eliason, Ferguson, Farrand, Ch I pp 1-20.

Instructional Aids:

Personnel: One lecturer

Equipment: Blackboard and chalk; Charts

Individual Equipment: Notebook and pencil

14th Hour - Lecture

Points to be Covered

1. Definition:

a. In order to understand any process something of the terminology must be known. These are terms that are related to inflammation and will be used in any and all medical installations.

- (1) Inflammation: It is an organized defense reaction of the body to disease or injury. It is the local response of the body to irritation (bacterial or traumatic such as the surgeon's knife).
- (2) Infection: Is the invasion of the body by disease producing bacteria. These bacteria having found a place where they can live and multiply, damage

the body through the production of toxins. Infections may be localized - affecting only a small area or be generalized - effecting organs or the whole body. A good example of a localized infection is a furuncle boil. Infection of an organ may be a pyolitis hepatitis, pneumonitis, etc.

- (3) Bacteremia is the presence of living pathogenic organisms (bacteria) in the blood stream. This is detected only by culturing the blood. It may occur in many diseases. In typhoid fever there is one place in which the bacteria are regularly found in the blood. In other diseases such as pneumonia and meningitis they may or may not be found.
- (4) Septicemia is the growing and multiplying of organisms in the blood stream - (differentiate between bacteremia). Blood poisoning is lay term.
- (5) Pyemia is the presence of pus in the blood stream. This usually occurs when a blood vessel in wall of an abscess is eroded through.
- (6) Necrosis - Death of tissue. It is nearly always the result of insufficient blood supply. The blood supply can be lost by action of bacteria as in a boil.
- (7) Lymphangitis - refers to infection with resulting irritation of the lymph vessels. Most of you have seen the red streaks up an arm or leg from a sore or a hand or foot. That was inflammation of the lymph vessels.
- (8) Lymphadenitis - is inflammation of the lymph nodes and is secondary to lymphangitis. Kernels are felt under the arm pit or in the groin.
- (9) The suffix "emia" refers to something occurring in the blood stream as bacteremia, septicemia.
- (10) The suffix "itis" refers to inflammation or infection of something--organ, etc - as appendicitis, tonsilitis.

## 2. Mechanism of Inflammation:

- a. And what happens in an inflammatory reaction? The object of an inflammatory reaction is to neutralize and remove an irritant. Foreign bodies and poisons in the body are removed by factors contained in the blood. These are the white cells which remove foreign bodies by phagocytosis (engulfing of the foreign body) and elements in the plasma and in the white cells which neutralize the poisons. In order to combat the irritation by these methods there must be an increase in the blood supply around the irritant and there must be some way for the cells and plasma to leave the blood vessels. This is brought about by the production of a substance by the irritated or damaged tissue which covers a marked dilatation of all the capillaries in the

neighborhood. This same substance causes an increased permeability of the capillaries so that the white cells can escape into the tissue. At the same time for some reason there is actually an increase in the number of white cells in the circulating blood. And what has happened? The irritant, a foreign body, is surrounded by a wall of white cells and fibers (protein deposited from the plasma); the dilated vessels make the area red; the escape of the fluid and cells from the vessels cause swelling; the dilated vessels bring in fresh blood all the time and also give off heat making the area hot. As the white cells are killed they are liquified in part and make up the greatest part of pus. The rest is made up of lymph fluid, and necrotic tissue. This causes some of symptoms and signs of inflammation.

### 3. Signs and Symptoms of Inflammation:

- a. Heat - an inflamed area is hot to touch due to an increased amount of blood flowing through the area.
- b. Redness - capillary dilatation on the skin.
- c. Swelling - due to increased cells, plasma, and intracellular tissue.
- d. Pain and tenderness due to the swelling stimulating the nerve roots in the skin.

### 4. Treatment:

- a. Rest of the affected part limits spread by directing energy at fighting the infection. Also increase movement of inflamed part tends to break down protective wall of leucocytes.
- b. Elevation of the part - promotes more efficient venous return and removal of waste products so that fresh blood can be dumped in.
- c. Application of heat and cold:
  - (1) Cold decreases the circulation when used early. It also reduces bacterial growth thus inhibiting infection. Also decrease the metabolism of food need of the part so that all may be used in the injured area.
  - (2) Heat increases the circulation which aids in the localization. Hot soaks of Sodium Chloride act by osmotic pressure and relieve some of the swelling. Wet heat is more efficient than dry heat.
- d. Chemotherapy - Best known are sulfa and penicillin. They keep the bacteria from multiplying so the body can overcome them.

e. Surgical drainage - The pressure from the pus can build up enough to damage surrounding tissues and must be drained off.

5. Conclusion with Summary:

a. Definitions:

- (1) Inflammation
- (2) Infection
- (3) Bacteremia
- (4) Septicemia
- (5) Pyemia
- (6) Neurosis
- (7) Lymphadenitis
- (8) Lymphangitis
- (9) Phagcytosis

b. Symptoms:

- (1) Heat
- (2) Redness
- (3) Swelling
- (4) Pain and tenderness

c. Treatment

- (1) Immobilization or rest
- (2) Elevation
- (3) Hot or cold applications
- (4) Chemotherapy
- (5) Surgical drainage

Training Notes:

- 1. Emphasize points brought out in the summary.

Eighth Period - Two Hours  
Strains, Sprains, and Dislocations

Place: Classroom

References: FM 21-10 par 119; FM 21-11, par 28; TM 8-220, par 150;  
 "Emergency Care," Wooders and Curtis, Ch 12

Instructional Aids:

Personnel: One lecturer; one demonstration team to each platoon.

Equipment: Blackboard and chalk; charts; Elastic bandages;

## Adhesive tape Triangular bandages.

Individual Equipment: Notebook and pencil

### 15th and 16th Hours - Lecture, Demonstration

#### Points to be Covered

##### 1. Introduction:

a. Importance of sprains, strains and dislocations. One of the most frequent injuries in field and in troops in training.

##### 2. Review of Anatomy of Joints:

###### a. Structure of articulating joints.

###### b. Types of joints:

- (1) Freely movable -- shoulder - hip
- (2) Partially movable -- elbow - knee
- (3) Slightly movable - vertebrae
- (4) Immovable -- pelvis - skull

##### 3. Strain

a. Definition: The stretching of ligaments and joint capsules when the movement of a joint is carried beyond the normal range.

###### b. Cause:

- (1) Direct violence
- (2) Indirect violence - twists

###### c. Symptoms:

- (1) Pain - sharp at time of injury - dull ache later.
- (2) Swelling - May be small amount or large depending on degree of injury.
- (3) Tenderness - amount depends on the extent of injury.
- (4) Loss of movement - usually not complete.
- (5) Hemorrhage - Usually not found in strains - but may be present as ecchymosis or bleeding into tissue.

###### d. Treatment:

- (1) Rest
- (2) Elevate part
- (3) Cold packs initially and then heat packs.
- (4) Support to joint - elastic bandage or adhesive usually applied by a doctor.

(5) Novocaine injection can be used by a doctor.

#### 4. Sprains

a. Definition - A severe stretching or tearing of ligaments or vessels.

b. Cause:

- (1) Direct violence
- (2) Indirect violence

c. Symptoms (similar to a strain except more severe):

- (1) Pain - sharp and severe at first with severe aching later.
- (2) Swelling - marked and rapid in development.
- (3) Hemorrhage - Usually present due to rupture of blood vessels.
- (4) Loss of motion - may be complete.
- (5) Tenderness - marked.

d. Treatment: Before any treatment is given be sure that the injury is not a fracture.

- (1) Rest
- (2) Cold packs at first and later hot packs.
- (3) Elevation of the part.
- (4) Immobilization of the part with elastic bandage, adhesive, or plaster usually applied by doctor.

#### 5. Dislocation:

a. Definition: The displacement of one end of a bone from its joining articular surface. A complete dislocation has the articular surfaces completely torn apart with one surface resting distant to the joint. The capsule of the joint is usually torn and the bone projects through. An incomplete dislocation has the surface torn apart without a tear in the capsules.

b. Cause:

- (1) Direct trauma to joint.
- (2) Indirect trauma as from extra muscular strain.
- (3) Congenital deformities - articulating surfaces are shallow so that ends slip apart easily.

c. Symptoms:

- (1) Pain in joint

- (2) Deformity at the joint.
- (3) Swelling and discoloration.
- (4) Loss of motion - complete.

d. Treatment: These are to be handled in the field as a fracture and splinted as they are. Attempts by untrained personnel to reduce these may cause a fracture, further tearing of capsule and ligaments, or impingement of bone on nerves and blood vessels.

- (1) Most important rule is to splint the dislocation and get to a doctor as soon as possible.
- (2) Morphine can be used for pain.
- (3) Heat will relieve some spasms and pain.

#### 6. Demonstration:

- a. Application of elastic bandage to ankle, knee, wrist, and elbow.
- b. Application of adhesive to ankle and to back and shoulder.
- c. Use of triangular bandages in splinting dislocation of shoulder.

#### Training Notes:

1. Stress the dangers of treating a fracture as a sprain or strain.
2. Stress the dangers of mishandling a dislocation.
3. Stress the danger in application of circular bandages, adhesive, etc. by untrained person.

#### Ninth Period - Two Hours Other Kinds of Injuries

Place: Classroom

References: FM 21-10 par 128-132; TM 8-220 par 142.

#### Instructional Aids:

Personnel: One lecturer; one projectionist

Equipment: Blackboard; charts; screen; projector; TF 8-2049

Individual Equipment: Notebook and Pencil

#### 17th and 18th Hours - Lecture; Demonstration

#### Points to be Covered

1. Introduction:

a. Bites by animals, reptiles and some insects can be as deadly as a bullet wound. Good first aid treatment may mean the difference between life and death.

2. Explanation:

a. Dog bite

(1) Chief danger is rabies or hydrophobia; a serious, fatal disease.

- (a) Cause: a filterable virus
- (b) Transmission: the virus is in the saliva of a rabid dog. It travels from the site of the bite along the nerves to the brain.
- (c) Onset of symptoms varies inversely with the distance of the bite from the brain. Incubation period varies from 20 to 40 days.
- (d) Symptoms:

- 1. Restlessness
- 2. Apprehension
- 3. Malaise
- 4. Violent spasms of muscles of swallowing and respiration.
- 5. Refusal of fluids
- 6. Drooling from inability to swallow.

(e) Prevention:

- 1. Prompt treatment of the bite.
- 2. Pasteur treatment: Anti-rabies vaccine given by a doctor--14 to 21 doses. Only 35% of people bitten by rabid dogs die.

(2) Treatment

(a) Treatment of bite

- 1. Wash wound thoroughly with soap and water.
- 2. Debride wound if necessary.
- 3. Cauterize wound with either of the following:
  - a. Fuming nitric acid followed by immediate application of baking soda.
  - b. Carbolic acid cleansed off immediately with 95% alcohol.
- 4. Apply sterile dressing.

(b) Treatment of dog:

1. Catch dog alive if possible and observe for 10 days. If symptoms appear the person bitten must receive Pasteur treatment or he will develop rabies.
2. If dog is killed the head should be sent to the laboratory for examination. The disease causes characteristic changes in the brain. If rabies is present the person bitten must receive Pasteur treatment.

b. Snake bite:

(1) Poisonous snakes of the United States:

- (a) Coral snake is small and slender and has black and red bands divided by narrow yellow bands encircling the body.
- (b) Pit vipers have stout bodies, thin necks, flat triangular heads. There is a blind pit between eye and nostril on each side of head. The grooved or hollow fangs fold back against the roof of the mouth and are elevated when the snake bites. This type includes rattlesnakes, copperheads, and cotton-mouthed moccasins.

(2) Types of toxin contained in snake venom: (some snakes have more of one type of venom than the other)

- (a) Neurotoxin, causes paralysis, shock, respiratory failure.
- (b) Hemolysin, breaks down red blood cells and injures blood vessel walls.

(3) Symptoms of poisonous snake bites:

- (a) Pain is severe
- (b) Swelling
- (c) Shock and weakness
- (d) Paralysis and respiratory failure
- (e) Bloody urine (hemoglobin in urine)
- (f) Death may occur during the first 24-36 hours.
- (g) Tetanus may follow.

(4) First Aid treatment

- (a) Apply tourniquet above the site of the bite. It should be tight enough to obstruct veins and lymphatics but not the arteries. Release it for 5 or 10 seconds every 15 minutes.

- (b) Have patient lie down.
- (c) Sterilize knife or razor blade in a flame. Sterilize the skin with iodine and make cross incisions  $\frac{1}{2} \times \frac{1}{2}$  inch or longer at each fang mark. Through the skin and into subcutaneous tissues (1/8 to 1/4 inch deep).
- (d) Apply suction over these wounds with suction cup, mouth, or bottle in which suction is obtained by burning a small piece of paper inside.
- (e) Give shock treatment--No alcohol.
- (f) No morphine--Barbiturates can be given.
- (g) Strychnine 1/10 grain is sometimes used for respiratory failure.
- (h) 5% glucose or transfusions may be necessary.
- (i) Make additional cross-incisions and apply suction as swelling spreads.
- (j) When not applying suction over the wounds, potassium permanganate or epsom salts compresses should be applied.
- (k) Tetanus precautions--Antivenoms are available against certain types of snake.

c. Black widow spider bite--These are quite poisonous and can be recognized by the crimson hourglass marking on the underside of the abdomen. The bite causes severe pain and violent muscle cramps, especially of the abdomen, with fever and sweating.

(1) Treatment

- (a) Have patient lie down.
- (b) Tourniquet and incision as for snake bite.
- (c) Keep patient quiet and warm. Hot baths.
- (d) Morphine gr.  $\frac{1}{4}$  to gr.  $\frac{1}{2}$ .
- (e) Calcium gluconate intravenously. 10cc of a 10% solution.
- (f) Apply suction over the wounds.

d. Tarantula bite--not very poisonous but infection may occur in the bite. Sulfanilamido powder may be of help. If infection occurs, hot compresses are used.

e. Tick bite--Ticks often are carriers of serious diseases and in removing ticks it is important not to crush them or leave the head in the skin. Apply a few drops of chloroform or ether and gently withdraw it. A lighted cigarette or hot pin held near the tick will often cause it to loosen its hold on the skin.

f. Bee, wasp or hornet bites--Press out the sting and apply a compress of dilute ammonia water or baking soda paste.

Training Notes:

1. Emphasize urgency for Pasteur Treatment in prevention of rabies.
2. Emphasize importance of first aid treatment in all bites.

**Tenth Period - One Hour**  
**Face and Jaw Wounds; Unconsciousness**

Place: Lecture Hall

References: "Textbook of Surgery," Christopher; "Textbook of Medicine," Cecil.

Instructional Aids:

Personnel: One lecturer; one projectionist

Equipment: Charts; blackboard; TF 8-2047; Projector and Screen.

Individual Equipment: Notebook and pencil

19th Hour - Lecture, Demonstration

Points to be Covered

**1. Introduction:**

a. Unconsciousness is one of the most difficult problems that you as technicians may have to handle. The main problem is that of making a careful and correct diagnosis. Remember that here the patient is unconscious can not help you with his symptoms. You must depend on signs. Signs will help, but even then many different things may give the same signs. Without a correct diagnosis the treatment is made difficult. We will try to give you some general rules for diagnosis and handling these cases.

2. There are some things that you must check for first as these will receive special treatment.

a. Breathing--always be sure the patient is breathing. In electrical shock, drowning or asphyxiation breathing may be stopped. Look for electrical outlets.

b. Hemorrhage.

c. Poisoning--check mouth for signs of burns or other signs of poison. Check for empty bottles.

d. Sunstroke--where is the patient? How hot is he? What has he been doing?

e. Head injury--look for signs of injury.

3. The classes of signs may be divided roughly into three types and treated accordingly. This is when a specific diagnosis cannot be made. Remember also that these types may not always hold true as there may be a mixture of any of the types.

a. Red Unconsciousness--red face and strong pulse. This type is seen in cerebro-vascular accidents, heat stroke, and diabetic coma. This type will also have a snoring type of breathing.

(1) Treat: Put in a lying position with the head slightly elevated. Keep the patient quiet. Cold to the head for pain. No morphine.

b. White Unconsciousness--fast weak pulse and pallor. Shallow breathing is also found. They have all the other symptoms of shock. This type is seen in fainting or neurogenic shock, heat exhaustion, or trauma.

(1) Treat: As any case of shock except trauma which will be given later.

c. Blue Unconsciousness--patient is cyanotic. The lips, nails, and ears have a bluish tinge. This is found in electrical shock, drowning cases, or any type of asphyxiation.

(1) Treat: As given in other lectures on asphyxiation.

#### 4. Common causes of Unconsciousness:

a. Stroke--apoplexy (Explain)

(1) Signs and symptoms:

- (a) Face red or ashen grey
- (b) Pulse strong and slow
- (c) Pupils unequal in size
- (d) One side of body or face limp.
- (e) Snoring type of breathing.

(2) Treat: As red unconsciousness.

b. Alcoholism

(1) Signs and symptoms:

- (a) Slow noisy breathing
- (b) Cyanosis
- (c) Rapid feeble pulse
- (d) Incontinence
- (e) Convulsions

(2) Treat: Pump stomach. Keep patient warm. Stimulants. O<sub>2</sub>. Vitamin B1 and Glucose.

c. Shock--as given in lecture on shock.

d. Hemorrhage--as given in lecture on hemorrhage.

e. Sunstroke--to be covered later.

(1) Treat: As red unconsciousness and cool patient off.

f. Heat exhaustion--to be covered later.

(1) Treat: As white unconsciousness and give salt.

g. Poisonous drugs--given in another course.

(1) Treat: For shock. Evacuate the stomach. Use antidote.

h. Fainting--Mild neurogenic shock.

(1) Treat: As white unconsciousness.

i. Epileptic convulsions

(1) Signs and symptoms:

(a) Tremor to violent convulsion

(b) Aura--warning symptom

(c) Deep sleep following attack

(2) Treat: Sedation. Keep patient from hurting himself during attack. Do not disturb following attack.

j. Diabetic coma--found in diabetics that have not been treated or who have not maintained their diet and insulin.

(1) Signs and symptoms:

(a) Red type of unconsciousness

(b) Acetone breath--airplane dope

(c) Sugar and acetone in urine

(2) Treat: I.V. fluids and insulin

k. Insulin shock--found in diabetics who have taken too much insulin.

(1) Treat: As white unconsciousness and give sugar.

1. Injuries: Part of these have been covered in previous lectures. Remember that the skull is a rigid structure within which is the brain and its coverings with the spinal fluid circulating around the brain. (Diagram).

(1) Types of Head Injuries:

- (a) Contusion
- (b) Concussion--contusion of the brain--boxing.
- (c) Hemorrhage--in relationship to the brain

- 1. Epidural
- 2. Subdural
- 3. Subarachnoid
- 4. Intracerebral
- 5. Interventricular

(d) Fractures

- 1. Linear
- 2. Basilar--most frequent type as the base of skull is the weakest part.
- 3. Depressed fracture--direct force--may be compound.
- 4. Penetrating fracture--always compound

(e) Treat:

- 1. Treat shock by heat only. Keep patient flat.
- 2. No morphine or stimulants
- 3. Ice bag to head for pain
- 4. Pulse, respiration, and blood pressure every 30 minutes. (Why)
- 5. Transportation must be slow and gentle
- 6. Dehydration
- 7. Lumbar puncture
- 8. Absolute bed rest for several weeks
- 9. Good nursing care

5. Face and Jaw Injuries:

- (1) Flesh wounds--already covered.
- (2) Fractured jaw--already covered. Repeat importance of keeping the tongue and jaw pulled forward. (How) (Why)
- (3) Hemorrhage--keep face downward. (Why)

Training Notes:

- 1. Stress emergency measures in head injuries.

2. Emphasize checking for signs which may require special treatment.
3. Emphasize types of unconsciousness and treatment of each.

**Eleventh Period - Two Hours**  
**Burns**

**Place:** Classroom

**References:** "Textbook of Surgery," Christopher; TB Med 151

**Instructional Aids:**

**Personnel:** One lecturer; one demonstration group each platoon.

**Equipment:** Blackboard; charts; heavy dressings with 3" roller bandage.

**Individual Equipment:** Notebook and pencil

**20th and 21st Hours - Lecture, Conference, Demonstration**

**Points to be Covered**

**1. Introduction:**

- a. In modern warfare burns are very common. This is due to high explosives, highly inflammable fuels and incendiary bombs.

**2. Explanation**

**a. Causes of burns:**

- (1) Thermal--fire, hot liquids, hot metals, explosives, burning fuels, etc.
- (2) Electrical--Electric currents, X-rays, etc.
- (3) Chemical--acids, alkalis, phosphorus

**b. Classification of burns**

- (1) First degree--skin not broken, merely has erythema (reddening of skin)
- (2) Second degree--The epidermis is destroyed. There may be blister formation.
- (3) Third degree--the epidermis and dermis are destroyed (actual charring and destruction of tissue). May involve muscle and bone.

**c. Effects of burns--Destruction of tissue, toxemia, shock, infection. Ulcers in stomach, duodenum and lower intestinal tract**

(cause unknown). Hemorrhage and necrosis of adrenals with adrenal deficiency. Frequently have all signs of infection in burns. Lung damage due to inhalation of gases, fumes, and smoke and heat.

d. Complications--Infection is the most serious immediate complication. Venous thrombosis and pulmonary infarction may occur and may be fatal. The most serious late complication is from scarring and contraction.

e. Treatment--Some of the old forms of treatment were Tannic acid, Picric acid, Gentian Violet, parafin coating, anesthesia and scrubbing. For the most part these have been abandoned and the following forms of treatment recommended:

(1) Emergency treatment--care must be taken to avoid contamination and sterile technique will be used in so far as is possible under the circumstances.

- (a) Cover burned area with a single layer of fine mesh gauze, (sterile). This can be plain or impregnated with vaseline. Over this should be applied a thick sterile gauze dressing (large or small first aid dressings are suitable). Then a firm gauze or muslin bandage should be applied.
- (b) Relief of pain--Morphine  $\frac{1}{4}$  or  $\frac{1}{2}$  grain. If no syringe is available place  $\frac{1}{4}$  grain tablet under the tongue and let it dissolve.
- (c) Prompt administration of plasma when feasible.

(2) Initial surgical Management

(a) Resuscitation--Deals primarily with anticipation, prevention, or corrective treatment of shock.

- 1. Sometimes give up to 12 units of plasma in first 24 hours. Give one unit for every point hemotocrit is above 45%.
- 2. Blood transfusions
- 3. Fluid infusions--for fluid administration other than that obtained from plasma or whole blood, 5% glucose in sterile water may be given. Normal saline may also be given.

(b) Relief of pain--important to distinguish between pain and anoxia as a source of restlessness, anxiety and apprehension. Pulmonary damage frequently causes anoxia.

1. Morphine  $\frac{1}{2}$  grain for pain. May be dangerous in anoxia.
2. Barbiturates
3. Paraldehyde should not be used because it is a lung irritant.
4. Oxygen therapy.

(c) Treatment of burned area--local treatment of burned area should be done with strict asepsis and full operating room facilities.

1. Minimal debridement--gentle cleansing with gauze or cotton and water. If burn is greasy neutral soap may be used. Green soap, brushes and general anesthesia not to be used. Small blisters will not be bothered--large ones may be aspirated.
2. Pressure dressings--as previously described watch for impaired circulation and infection. Dressings may be left in place 10 to 14 days.

(d) Treatment of impending infection--Penicillin is the drug of choice over sulfa drugs. Drugs will be prescribed and the method of administration determined by a medical officer.

(e) Reparative and reconstructive surgery--done in later stages and comes under the heading of plastic surgery.

### 3. Demonstrations:

- a. Instructors review the main points on treatment of burns and demonstrate measures of treatment.

### 4. Discussion:

- a. Students may ask questions and discuss problems with instructors.

### Training Notes:

1. Stress importance of correct emergency measures in offsetting complications.

### Twelfth Period - One Hour Chest Wounds

Place: Lecture Hall

References: FM 21-11, par 13; "Textbook of Surgery," Christopher; TB Med 116; TB Med 147.

Instructional Aids:

Personnel: One lecturer; one projectionest

Equipment: Charts; Blackboard; Opaque projector

Individual Equipment: Notebodd and pencil

22d Hour - Lecture, DemonstrationPoints to be Covered

## 1. Introduction:

a. Statistics show that 20% of all war wounds are of the abdomen or chest regardless of the type of weapons used. Of those over one-fourth are of the chest alone. Statistics also show that 25% of all chest wounds die between the field and the collecting stations. A large number of these cases could be saved with proper first aid treatment. To understand chest injuries the technician must know something of the anatomy and physiology of the chest.

## 2. Anatomy and Physiology:

a. You will recall that the chest is composed of a boney cage which is covered with muscle and skin. It bounded above by the structures of the neck and below by the diaphragm. The thoracic cage is lined by the pleura which also covers the lungs. Situated in the center of the chest is the mediastinum which serves to divide the chest into two parts, the pleural cavities in which lie the lungs. In the mediastinum are found the heart, trachea, bronchi, and the great blood vessels all of which are enmeshed in very loose connective tissue. Many blood vessels are present in the chest including the intercostals, running along the lower inner surface of the ribs; the internal mammary vessels, running on the inner surface of the ribs on both sides of the sternum; the vessels in the lungs themselves; and the large mediastinal vessels.

b. Remember that the lungs are passive organs - that means that by themselves they cannot expand or function in respiration. Remember also that the lungs lie in a closed cavity in which there is a slight negative pressure. On inspiration the muscles of the chest wall lift the ribs upward and outward increasing the diameter of the chest. At the same time the diaphragm contracts and flattens out thus increasing the size of the cavity from top to bottom. This increase in size of a closed cavity increase the negative pressure. This is transmitted to the elastic lung which also expands passively due to the pressure and thus draws air into the lungs from the trachea. On expiration the chest muscles are relaxed and the weight of the chest causes the ribs to fall back into place. The same is true of the diaphragm and air is

forced from the lungs.

3. Types of Injuries: Wounds of the chest may involve only the structure of the wall, of the contents, or of both the wall and the contents.

a. Flesh wounds - Involve muscle and skin. The treatment of this type is the same that applies to the ordinary flesh wound.

b. Fractured ribs - Most of the fractures are between the 5th and the 9th as the upper ribs are protected by the clavical and shoulder and the lower ones by the fact that they are attached at one place only. Fractured ribs are diagnosed by pain on breathing, crepitus at site of injury. There may or may not be swelling and discoloration. X-ray gives a positive diagnosis. Treatment consists of immobilization by adhesive strapping for 14-18 days. Morphine can be used for pain if there are no other injuries.

c. Vessels - The intercostal or internal mammary vessels may be injured by fractured ribs or by missiles. The bleeding is very profuse and can be controlled only by pressure dressings and in many cases only by hemostat and ligature.

d. Blast Injuries - Those are injuries to the lung from near by explosions. There is a disruption of the small vessels in the lungs with bleeding. Supportive therapy and symptomatic treatment is all that can be done. Oxygen can be used.

e. Pneumothorax is the important type of injury to know about. This consists of air in the pleural cavity. There are three types.

(1) Closed pneumothorax is where air has entered the thorax but can not escape - neither does more air enter. The lung is collapsed and the mediastinum tends to be pulled to the opposite side by the negative pressure on the unaffected side.

(2) Open or sucking pneumothorax. This the most important type in relation to first aid work. Here there is an opening in the chest wall which permits the air to enter and leave the chest with each breath. When this happens the mediastinum, due to the pull of the changing pressures in the chest, moves to and fro. If the hole is large enough then air will not even enter the uninjured side and the patient dies of lack of oxygen.

(a) Treatment: Air tight pressure dressing in order to stabilize the mediastinum. Use cellophane, wax paper, rain, coat, etc.

(3) Tension pneumothorax - Here air enters with each

respiration but cannot leave. There is a valve like action of the wound. Treatment is withdrawal of air from the affected side by means of a needle.

f. Hemothorax - bleeding into the thoracic cavity. Treatment consists of supportive measures. Keep the patient on the affected side.

g. Traumatic asphyxia - caused by crushing of chest which is prolonged. This forces venous blood into head and neck and disturbs circulation. Treatment is oxygen and supportive measures.

h. Emphysema - Escape of air into the tissues. May be external or mediastinal. If external pressure dressing at site of escape of air.

#### 4. General Rules of Treatment:

a. Keep patient quiet and warm.

b. Patient can be turned to injured side.

c. Morphine only if there is no respiratory embarrassment. Codeine can be used.

d. Dress wound - Use air tight dressing if necessary.

e. Set patient up unless in deep shock.

f. Treat shock.

g. Handle gently and evacuate rapidly.

#### 5. Demonstration:

a. Types of injuries illustrated by use of the opaque projector and Ciba "War Injuries of the Chest."

#### Training Notes:

1. Stress emergency treatment of sucking wounds of the chest.

2. Emphasize general rules of treatment.

#### Thirteenth Period - Two Hours Injuries Due to Heat and Cold

Place: Classroom

References: TB Med 175; TB Med 81

## Instructional Aids:

Personnel: One lecturer; one projectionist

Equipment: Blackboard and chalk; Film projector and screen; FB 180; TF 8-2057, "Personal Health in the Jungle" (15 minutes) - "Trenchfoot" (14 minutes)

Individual Equipment: Notebook and pencil

## 23rd and 24th Hours - Lecture, Demonstration, Film

### Points to be Covered

#### 1. Introduction

a. The loss of body fluid normally occurs through four (4) channels: lungs, kidney, skin, and large intestines. The amount of body fluids lost and the replacements needed will vary with the activity of the individual and the temperature of the external environment. Loss of fluid occurs in approximate amounts as follows:

- (1) Lungs 500-500 cc
- (2) Kidney 500-1500cc
- (3) Perspiration 1000-4000cc
- (4) Colon 200-500cc

Replacement occurs through diet. (1000-1250cc) and fluid intake which will include water, milk, soft drinks, and other liquids. We also know that in a normal individual salt is excreted in the urine and perspiration. Normally the salt intake is equal to the output. In hot weather, however, excessive amounts of salt are lost through perspiration. If enough salt is lost heat exhaustion results.

#### 2. Heat Exhaustion

##### a. Symptoms

- (1) Headache
- (2) Loss of appetite
- (3) Drowsiness
- (4) Extreme weakness
- (5) Visual disturbances
- (6) Dizziness
- (7) Inability to walk
- (8) Cramps of limb and abdominal muscles
- (9) Faintness or unconsciousness

##### b. Physical findings:

- (1) Skin is cold and clammy. Profuse perspiration.

- (2) Pupils dilated.
- (3) Face is pale.
- (4) Rectal temperature is normal or slightly elevated, 99-101° F.
- (5) Blood pressure is lowered. Pulse is weak and rapid.

c. Treatment. The most important thing in treatment is administration of salt.

- (1) Remove the patient to a cool place where he may rest and receive large quantities of salt solution.
- (2) .1% saline solution (made up as described earlier) by mouth.
- (3) If the collapse is severe, physiological saline solution should be given intravenously.
- (4) In some cases, the temperature may be subnormal, and external heat may be necessary.
- (5) Stimulants can be given.
- (6) Keep the patient lying down with head level or low until he recovers.

### 3. Heat Stroke

a. This is due to excessive heat which causes disturbance in the functioning of the heat control center of body thermostat located in the hypothalamus of the brain. When misfortune occurs there is a cessation or diminishing of perspiration, sudden collapse, and afterwards coma.

- (1) Symptoms: This condition often appears with dramatic suddenness, characterized by collapse, delirium unconsciousness or coma. Certain symptoms and physical findings are characteristic.
  - (a) Diminished sweating
  - (b) Headache
  - (c) Dizziness
  - (d) Irritability
  - (e) Visual disturbances such as dim or purplish vision
  - (f) Nausea and vomiting
  - (g) Dryness of skin, which is very hot, face is flushed
  - (h) Elevated body temperature (106 to 110° F. rectally.)
  - (i) Rapid pulse (160 - 180)
  - (j) Increased depth of respiration.

b. Treatment: The single, most important objective in treatment is the lowering of the body temperature and this must be

initiated immediately and continued during the transfer of the patient to a hospital.

- (1) Remove all the patient's clothes except for shorts and sprinkle the entire body with cool or tepid water. Ice water should not be used. A hand spray such as a flit gun is good for this purpose, since with a fine spray the water evaporates more rapidly and produces a better cooling effect. The patient should be placed in the shade during treatment.
- (2) Fan the patient. During transportation, the door of the ambulance should be left open so that the current of air passing over the patient's body evaporates the water. Electric fans are best.
- (3) Briskly rub the arms, legs and trunk to increase circulation to the skin. An ice bag can be applied to the head.
- (4) The rectal temperature should be checked every ten minutes. When it reaches  $102^{\circ}$  F, the cooling treatment should be stopped since often the temperature will continue to fall and may reach dangerously low levels. If the rectal temperature should fall below  $94^{\circ}$  F, the patient should be cautiously warmed until the temperature is normal.
- (5) Saline solution should be given intravenously or subcutaneously. When the patient is able to drink, .1% salt solution should be given freely by mouth.
- (6) If cyanosis is present, oxygen should be given by face mask. In some cases, artificial respiration may be necessary.
- (7) Stimulants are not given. If sedatives are necessary, barbiturates can be given. These are also given in case of convulsions.
- (8) Patients who survive to the second day usually recover, though a rectal temperature of  $102^{\circ}$  to  $103^{\circ}$  F may persist for several days, along with such symptoms as mental disturbance, excitement and delusions. Headache may last for several weeks. Relapses can occur during the first few days, so the patient must be carefully watched and his temperature frequently checked.
- (9) One attack of heat stroke predisposes the individual to a second attack, so the patient should be careful about further exposure to excess heat.

#### 4. Heat Cramps

a. This condition is due to a deficit of salt in the body, and consists of painful spasms of the voluntary muscles in the extremities and abdominal wall. They may be excruciating and completely disabling. The treatment consists of administration of physiological saline solution intravenously and .1% salt solution by mouth.

## 5. Frost bite

a. This occurs most commonly at temperatures below  $10^{\circ}$  C ( $14^{\circ}$  f) especially when a strong wind is blowing.

### (1) Symptoms:

- (a) Skin assumes a dull, yellowish pallor.
- (b) Numbness or a prickling sensation associated with formation of ice crystals in the tissues.
- (c) If deeper tissues are not also frozen, there is a sensation of a movable plaque or coin buried in the skin. With deep freezing the tissues are solid and immovable.
- (d) Edema and hemorrhage may occur in severe cases when the part is thawed. Often the skin on thawing resembles a severe burn.
- (e) Prolonged exposure to cold causes the individual to become numb and drowsy, his eyesight fails and he becomes unconscious. Respiration may cease.

### (2) Treatment for frost bite:

- (a) The most important and most dangerous phase of the treatment of frost bite is the period of thawing. The tissue must not be heated rapidly or warmed above body temperature. It should not be rubbed vigorously or massaged roughly. The skin can be rubbed off unless it is handled carefully. Care should be taken to avoid undue contamination as frozen tissue may become infected as readily as any other wound. If the part does not become normal quickly the area should be painted with a mild antiseptic, wrapped in sterile dressings, and placed at rest. During the period of thawing if pain or throbbing develop the temperature is too warm and the part is being thawed too rapidly. Cooling can be effected by wrapping the limb in sterile dressings and applying ice bags or by having an electric fan blow over the area.
- (b) During thawing the following changes may occur:
  - (1) White patches may become red, itchy, and painful.
  - (2) Blisters and peeling. This may be followed by pigmentation lasting many months.
  - (3) Rapid and marked swelling (Edema). The latter is liable to split frozen tissue and to break frozen blood vessels causing hemorrhage under the skin. If blisters develop they should

not be disturbed unless absolutely necessary.

(c) Under war time conditions it is not always possible to properly prevent frost bite. Measures of value include the prevention of circulatory stasis by: constant movement, loose clothing (preferably in multiple layers), loosening shoes and boots when possible, protection against wind, good foot-gear and socks, avoidance of chafing and sweating of feet during marches, frequent changes to dry socks. Other measures are: wearing two pairs of socks loose and un-wrinkled, not wearing rubber boots for long marches which increase sweating, rubbing oil gently into skin until it disappears, good gloves (mittens preferable), no beards as frost from breath collects and freezes skin.

## 6. Trench-foot

a. Definition: Term applied to the condition resulting from prolonged exposure of the feet to cold and moisture, usually associated with depending and immobility and with constriction of the limbs by shoes or clothing.

b. Pathogenesis - cold and immobility causes a vaso-constriction of wall blood vessels, covering ischemia and anoxia with resulting damage to capillaries and even larger blood vessels. Nerves may and usually are damaged in some case.

c. Symptoms - mild, moderate, severe.

### (1) Early

(a) Coldness of feet followed by numbness may be tingling, early cramping and aching of feet. Discomfort not severe. Patient complains of anoxia (can't feel his feet when he walks so tends to stagger) - walking on blocks. Skin is cold, waxy white to purplish.

(2) Later: Hyperemic in inflammatory stage. Rapid swelling of feet with intense pain. Hemorrhage under skin. Formation of blisters, possible gangrene. Skin painful to touch in parts and anesthetic in other parts.

### d. Prophylaxis:

(1) Loose fitting, water proof shoes; warm dry socks; exercise; avoid prolonged exposure; avoid tight

clothing. Keep shoes and socks dry.

e. Treatment

- (1) Carry patient to hospital
- (2) Keep body of patient warm but feet cool. In some cases ice packs can be used but feet must be kept dry.
- (3) Handle feet gently - no massage.
- (4) Strict asepsis must be maintained to prevent infection of the damaged tissues.
- (5) Protect against pressure neurosis by frequent turning or pressure rings.

7. Demonstration

a. FB 180, "Trench-foot," 14 minutes.

b. TF 8-2057, "Personal Health in the Jungle," 15 minutes.

Training Notes:

1. Emphasize emergency measures in heat stroke.
2. Emphasize use of salt in prevention of heat exhaustion.
3. Emphasize importance of thawing period in frostbite.
4. Emphasize prophylaxis for trench-foot.

Fourteenth Period - One Hour  
Asphyxia

Place: Classroom

References: FM 21-11, Sec IV; TM 8-220 par 145; "Emergency Care," Wooders and Curtis, Ch 5 Sec II.

Instructional Aids:

Personnel: One lecturer; one projectionist

Equipment: Blackboard and chalk; charts; TF 8-1429, "Physiology of Anoxia;" Film projector and screen.

Individual Equipment: Notebook and pencil

26th Hour - Lecture

Points to be Covered

1. Introduction:

- a. Organs of the respiratory system.
- b. Nerve system that controls respiration.
- c. Definitions of:

- (1) Hemoglobin is the oxygen carrying pigment of the red blood cells.
- (2) Oxygen is a component of air essential to respiration.
- (3) Carbon dioxide is an essential gaseous waste product of the body excreted in exhaled air.
- (4) Carbon monoxide is a poisonous gas.
- (5) Anoxia means an oxygen deficiency.
- (6) Asphyxia means a lack of oxygen which may cause breathing to stop.
- (7) Suffocate means to die due to a cutting off air supply.
- (8) Smother means to kill by cutting off air supply.
- (9) Strangle means to kill by choking or squeezing the throat.
- (10) Choke means to strangle by closing the windpipe.

2. Explanation

a. Causes of Asphyxia:

- (1) Drowning: A form of asphyxia resulting from too long immersion in water and the too long a period without oxygen supply to the lungs.

(a) Symptoms:

- 1. Body usually cold appears blue (cyanotic), limp and apparently lifeless.
- 2. Mouth, nostrils and trachea filled with thick mucous and tongue usually swollen.
- 3. Respiratory efforts may have ceased or may still produce an occasional gasp.
- 4. Pulse very weak or imperceptible.

b. Types of Accidents

(1) Treatment of asphyxia from drowning:

- (a) Apply artificial respiration immediately.
- (b) Do not waste time in trying to drain water from lungs by "jack knifing" patient.
- (c) Remove wet clothing, keep body warm and give warm stimulating drinks when the patient regains consciousness.

(2) Electric Shock: Electric currents passing over or through the body may have a damaging (paralyzing) effect upon the nerve centers of the respiratory and circulatory systems. Accordingly asphyxia may result because of this damage.

(a) Symptoms:

1. At first a very unpleasant and numb sensation when wire touches body.
2. Very sudden loss of consciousness with very slight or no indications of breathing.
3. Patient usually appears blue (cyanotic) occasionally may appear very white.
4. Very weak pulse which may become imperceptible.

(b) Treatment:

1. Immediate release of victims from the electric current.
2. Immediate application of artificial respiration.
3. Keep patient warm.

(3) Choking: A state of partial or complete asphyxiation produced by a foreign object adhering to or closing off the respiratory passages in the pharynx and trachea

(a) Symptoms:

1. Face becomes cyanotic.
2. Patient gasps, coughs, and gags simultaneously and alternately.
3. Difficulty in breathing may be marked if object is large and a noncollapsible material.

(b) Treatment:

1. The stimulus of slapping the back forces coughing which may dislodge foreign object.
2. When object can be reached the index finger may carefully be hooked around object to remove it from throat.
3. Place patient on abdomen with head lower than feet while administering slaps to the back.
4. Artificial respiration may be resorted to if object cannot be removed.

(4) Gas poisoning (carbon monoxide) - carbon monoxide combines with red blood cells 250 times more readily than oxygen. Carbon monoxide, therefore, displaces oxygen in the blood causing the body to suffer from oxygen starvation just as if the patient were being choked to death.

(a) Symptoms:

1. Yawning
2. Headache
3. Dizziness
4. Weariness
5. Ringing in ears
6. A fluttering and throbbing of the heart.
7. A peculiar red color of the skin rather than the blueness of other types of asphyxiation.

(b) Treatment:

1. Get patient into fresh air quickly.
2. Give artificial respiration if breathing has stopped or is fitful.
3. Oxygen therapy has a great life saving value in this type of asphyxia.

3. Film - TF 8-1429 "Physiology of Anoxia."

Training Notes:

1. Stress the importance of immediate emergency treatment in those types of accidents.
2. Stress that appearance of bluish color of skin (cyanosis) is a symptom of asphyxia but not necessarily an emergent condition.

Fifteenth Period - Two Hours  
Artificial Respiration

Place: Classroom

References: FM 21-11, par 37-39; "Anatomy and Physiology," Greisheimer, 4th Ed, pp 545.

Instructional Aids:

Personnel: 1 man to direct conference; 1 demonstration team per platoon.

Equipment: 1 blanket per team; Blackboard and chalk.

Individual Equipment: Notebook and pencil; 1 blanket per two men.

27th and 28th Hours - Conference, Demonstration, Application

Points to be Covered

1. Introduction and explanation:

a. Indications for artificial respiration are anything which causes stopping of breathing. Some of the more common causes for breathing to stop are:

- (1) Drowning
- (2) Electrical shock
- (3) Gas poisoning
- (4) Infantile paralysis

b. Important considerations in giving artificial respiration:

- (1) Do not move patient unnecessarily. Begin resuscitation at nearest point to where accident occurred causing breathing to stop.
- (2) Do not stop to loosen patient's clothing but begin actual resuscitation at once.
- (3) Have assistant loosen or remove wet clothing while treatment is being given.
- (4) Continue artificial respiration without interruption until natural breathing is restored or until a physician declares the patient dead. Cases are on record where spontaneous breathing occurred after five hours of artificial respiration.
- (5) Keep the patient warm.
- (6) In electrical shock the first step is to rescue the person from the live wire. This is dangerous. If the switch is near turn off the current but do not waste time looking for a switch. Use a dry pole, dry rope, dry clothing or some other material which will not conduct electricity, when removing a person from a live wire.

2. Demonstration: Demonstrate Schafer method of artificial respiration.

3. Steps in procedure:

a. Place patient face down.

b. Turn head to one side; force his mouth open, pull his tongue forward, remove false teeth, vomitus, or debris from his mouth and throat.

c. One arm should be extended above the head, the other should be bent at the elbow so that one side of his face can rest on his hand.

d. Kneel astride the patient's thighs, with knees far enough from his hips so that pressure can be made on his lower ribs.

e. Place the palms of the hands on the back with the little finger just touching the lowest rib, the thumb and fingers in their natural position, and the tips of the fingers out of sight just around the sides of the chest. The heels of the hands should be placed as far as possible from his backbone without slipping off.

f. With arms held straight, swing forward slowly so that the weight of the body is gradually brought to bear upon the patient. Do not bend elbows.

g. Now immediately swing backward so as to remove all pressure completely and suddenly.

h. After about 2 seconds, repeat the procedure. The combined period of pressure and release should take about 4 or 5 seconds and should be repeated 12 to 15 times a minute.

i. Because of the length of time artificial respirations may be necessary, more than one person may be required to give it. The change in operators should occur without causing a break in cadence.

#### 4. Application:

a. The students working in pairs alternately as patient and operator will administer the Schafer method of artificial respiration until each operator is able to apply it correctly.

#### Training Notes:

1. Emphasize applying pressure slowly and releasing it suddenly.

2. Stress importance of regular cadence in applying artificial respiration.

3. Stress continuance of treatment until patient is pronounced dead by a doctor.

#### Sixteenth Period - One Hour Blood Groups and Plasma

Place: Classroom

References: "Physiology and Anatomy," Greisheimer, pp 395, 4th Ed; "Anatomy and Physiology," Kimber, Gray, Stackpole, 11th Ed, pp 299; FB 176, "Blood Bank in NATOUS."

Instructional Aids:

Personnel: 1 lecturer; 1 projectionist.

Equipment: Blackboard and chalk; Film projector and screen; Charts.

Individual Equipment: Notebook and pencil.

29th Hour - Lecture, Demonstration, FilmPoints to be Covered

## 1. Composition of blood:

a. Cells constitute about one-half the volume of blood.

- (1) Red blood cells are concerned chiefly with carrying oxygen. They contain hemoglobin which unites chemically with the oxygen.
- (2) White blood cells help to protect the body from disease germs. They also have other functions among which is to aid in tissue repair.
- (3) Platelets aid in the clotting of blood.

b. Plasma is the fluid part of the blood. It contains a great variety of substances since it serves as a source of nutrition to the cells of the body and as a means of removing waste products from those cells. Plasma also serves as a medium to carry internal secretions and antibodies against disease germs. Prepared blood plasma which is given intravenously is not of any type and so may safely be given to all persons.

2. Transfusion is the transfer of blood from one person (the donor to another (the recipient). The most commonly used method of giving a transfusion is the indirect method in which donor's blood is withdrawn into a flask and prevented from clotting by use of sodium citrate. It is then injected intravenously.

3. Blood banks keep quantities of citrated blood stored under ideal conditions, and lists of blood donors. Through the use of blood banks blood for transfusions is available on short notice.

4. Blood typing is the classification of blood into groups. It is dependent upon clumping or agglutination of blood cells. Before a blood transfusion is given a blood typing test is necessary, for blood of recipient and donor should be of the same type. To explain blood typing, blood cells are said to contain a factor which permits the cells to clump together, designated by the capital letters "A" or "B." Serum is said to have a factor which causes clumping of cells designated

ted by "a" or "b." Clumping occurs when factor A comes into contact with factor a or when factor B comes into contact with factor b. Blood types depend upon the presence or absence of these two factors.

5. Blood groups are named in terms of the factors A or B in the cells. This is the Landsteiner method and is the one used in the army. "O" indicates neither A or B is present. The following chart shows the factors A and B or a and b present in each group:

Group	Factors in cells	Factors in serum
O	none	ab
A	A	b
B	B	a
AB	AB	none

Blood typing determines the group in this way: Whole blood of unknown type is mixed separately with known serum of each type. The serum that does not cause clumping of the blood cells is of the same type as the blood. For example the serum of type O blood contains factors ab. Type O blood cells contain no factors and so will not clump. Type A blood cells contain factor A and will clump when factor a from the serum comes in contact with factor A in the cells. By the same reasoning it can be seen that cells of types B and AB will also clump.

#### Training Notes:

1. Emphasize that blood groups are determined by blood typing.
2. Emphasize that blood plasma is not of any type.

#### Seventeenth Period - One Hour Transfusion and Intravenous Therapy

Place: Classroom

References: TM 8-61 Sec IV; TM 8-210, par 57; AR 40-1715; "Anatomy and Physiology," Greisheimer, ch 10.

#### Instructional Aids:

Personnel: One lecturer; one demonstration team each platoon.

Equipment: Charts; blackboard and chalk; Transfusion set; Intravenous set.

Individual Equipment: Notebook and pencil

30th Hour - Conference, Demonstration

Points to be Covered

## 1. Introduction:

a. In many types of sickness and illness, the treatment of the patient has been made much easier and more simple since the advent of intravenous techniques. Drugs have been standardized and sterile techniques have been so perfected, that intravenous therapy is considered quite safe and is accepted throughout the medical world.

2. Explanation: There are many instances where I.V. therapy is required. Some of those which are of interest to the technicians are:

a. Shock: Whole blood and plasma are mostly used. This has been covered in previous classes.

b. Coma: It is not good practice to force a comatose patient to take food and fluids by mouth because of the danger of strangulation. The intravenous route is the safest and best way to give the patient food and fluids. Saline and glucose solutions are used here.

c. Abdominal Injuries: Food and water are never given a patient with a perforated bowel. Seepage will cause peritonitis, delayed healing and possibly death.

d. Injuries of the throat, mouth or esophagus. Injuries to these parts often make swallowing impossible. I.V. therapy furnishes the only means by which the patient can be given food and liquids.

e. Diarrheas: Frequently there may be profuse diarrhea and vomiting and extreme dehydration. Cholera is a good example. Some of the other bacillary dysenteries are bad. Glucose and saline must be used.

f. There are certain infectious and contagious diseases which require specific I.V. therapy. In most of these the responsibility for preparation and administration of the drug lies with the medical officer.

- (1) Syphilis--Mepharsin
- (2) Relapsing Fever--Mepharsin
- (3) Septicemias--Penicillin and sodium sulfathiazole

g. There are a few drugs which are given frequently by I.V.

- (1) Diuretin--congestive heart failure and kidney disorders.
- (2) Aminophyllin--Asthmatics
- (3) Stimulants--coramine

3. Demonstration

- a. Discussion of equipment used in various types of sets.
- b. Use of transfusion sets.
- c. Use of intravenous sets.
- d. Demonstration of method of cleaning and putting up the various types of sets.

Training Notes:

1. Stress that in most instances the technician is concerned with assisting with rather than actually carrying out transfusion and intravenous procedures.

2. Stress extreme importance of cleaning all equipment immediately after use.

Eighteenth Period - One Hour  
Abdominal Wounds

Place: Classroom

References: FM 21-11 par 13; "Textbook of Surgery," Christopher.

Instructional Aids:

Personnel: One lecturer; one projectionist.

Equipment: Blackboard and chalk; American Frohse charts; Opaque projector and screen; Film Ciba, "War Injuries of the Abdomen."

Individual Equipment: Notebook and pencil

31st Hour - Lecture; Demonstration

Points to be Covered

1. Introduction

a. Twenty percent of all wounds involve chest and abdomen. Because of extreme danger of shock following this type of injury, it is necessary to recognize these wounds immediately, and evacuate patient to an emergency station or hospital in order that treatment may be started with least possible delay.

2. Types of wounds:

a. Penetrating wound: One that lays open an important cavity of the body. The entrance of the wound may be anywhere due to the high velocity of present day missiles. Organs which may be injured by a penetrating wound include stomach, intestines, kidneys, spleen, liver, biliary bladder, urinary bladder, large blood vessels, etc. Any one or combination of these organs may be injured by same object. Part may be simply perforated as by a bullet or it may be shattered as by a shell fragment.

b. Blast wound: One which results from or near an explosion. Resulting wounds may be merely rupture of small vessels supplying internal organs, or may be actual rupture of these organs.

c. Crush or impact wound: One which results from falling debris or other sudden powerful contact injury. Crush wounds may injure abdominal wall or any of the internal organs. Organs most frequently wounded by crush wounds include spleen, liver, and kidneys due to the compact nature of their structure.

### 3. Signs and symptoms:

a. Note type of wound. In penetrating wounds note wound of entrance and exit. Treat all wounds of abdominal wall with great care until proven there are not internal injuries.

b. Pain: Usually severe shortly after injury.

c. Shock: Frequently follows any injury or handling of internal organs.

d. Rigidity of abdominal wall: Blood, intestinal contents, or foreign bodies in abdominal cavity frequently causes abdominal muscles to contract and thus become hard and rigid.

e. Lack or loss of intestinal movement: Demonstrated by lack of sounds heard when listening with a stethoscope but this is not always a reliable demonstrable symptom.

f. Nausea and vomiting: Patient may vomit blood.

### 4. Treatment:

a. Nothing by mouth to be given in any suspected wound of this type.

b. Apply dressings to all open wounds as in any other type of flesh wound. (If intestines, or other organs hang out, do not try to replace, simply cover entire area with sterile dressings.)

c. Treat shock.

d. Evacuate to emergency station or hospital as soon as possible. Patients with these types of wounds should have top priority in any evacuating process.

e. Relieve pain with morphine if available.

5. Demonstration:

a. Film, Ciba, "War Injuries of the Abdomen."

Training Notes:

1. Emphasize importance of immediate treatment of wounds of the abdomen.

2. Stress the importance of giving nothing by mouth in suspected wounds of the abdomen.

3. Stress urgency of evacuating patients with abdominal wounds to a hospital as soon as possible.

Nineteenth Period - One Hour  
Use of Plasma and Blood Substitutes

Place: Classroom

References: AR 40-1715; TM 8-210 par 57; TM 8-611 Sec IV; "Physiological Basis of Medical Practice." Best and Taylor, Ch V.

Instructional Aids:

Personnel: One officer lecturer; one demonstration group each platoon; projectionist.

Equipment: Charts; plasma kits; blackboard and chalk. FS 8-51; Projector and screen.

Individual Equipment: Notebook and pencil

32d Hour - Conference, Demonstration

Points to be Covered

1. Introduction:

a. Whole blood is the ideal transfusion fluid in most cases. However, whole blood is of limited supply and its storage and proper transportation frequently make its use impractical. In time of war there is a great need for transfusion fluids and the supply of whole blood is sometimes inadequate. Therefore much work has been done on blood substitutes.

## 2. Explanation

a. Plasma is whole blood with the cells removed.

(1) Advantages of using plasma:

- (a) It contains all properties of blood except those related to the cells.
- (b) It can be collected from all types of donors and pooled.
- (c) Typing and cross matching are not necessary before it is given.
- (d) It can be collected and stored under sterile conditions under refrigeration indefinitely.
- (e) It can be dried and stored to be transported great distances.

(2) Disadvantage of plasma is that it does not provide blood cells which may be sorely needed by the wounded soldier.

b. Intravenous fluids are used in the treatment of conditions requiring augmentation of the volume of the blood. If the circulation is good, the fluid is rapidly lost through the kidneys and other excretory organs or by absorption into the tissues. For this reason intravenous infusion is considered as having only a temporary effect in increasing the volume. It is helpful in replacing lost tissue fluids and to replenish base chlorides and furnish glucose but is not truly a blood substitute. Most commonly used solutions are salt solutions and glucose. Because of osmosis only the same percentage of salt as is found in the blood can be used. This is called Physiologic sodium chloride solution or normal saline. For practical purposes only sodium chloride is used as a general rule. Glucose may be given in 5 to 50% strength according to the purpose for which it is used. It may be in solution in distilled water or normal saline.

c. Other blood substitutes have been tried but are not generally used. In each an effort is made to make a substitute which resembles plasma as nearly as possible. Research is still being carried on along these lines.

## 3. Demonstration:

a. Demonstrate how to set up and give plasma.

Training Notes:

1. Emphasize use of plasma as a blood substitute.
2. Stress setting up of plasma unit.

Twentieth Period - One Hour  
Classification and Care of Wounds (Review)

Place: Classroom

References: FM 21-10, ch 10, Sec II; TM 8-220, par 140-141; FM 21-10, par 114-115; FM 21-11, par 6, 9; FM 8-50, pp 1-40, 42-43; TB Med 116; TB Med 147.

Instructional Aids:

Personnel: One man to direct conference

Equipment: Blackboard and chalk; American Frohse charts.

Individual Equipment: Notebook and pencil

33rd Hour - Conference

Points to be Covered

Note to Instructor: Since this is a review class it should be conducted as a conference bringing out the important points of periods 2 and 3. The following outline may be used as a guide from which to direct the conference.

1. Definition of a wound:

a. A break in the skin, mucous membranes, or deeper structures.

2. Types of wounds: As to bacterial content:

a. Aseptic

b. Contaminated

c. Septic or infected

d. Poisoned

3. Classification of wounds: As to etiology and appearance:

a. Abrasion

b. Contusion

c. Incised

d. Lacerated

e. Contused Wound

f. Puncture, penetrating, or perforating.

4. Special Types of Wounds

a. Chest wounds:

- (1) Flesh wounds
- (2) Ribs - simple or compound
- (3) Intercostal vessels - How bleeding is controlled
- (4) Internal chest injuries
  - (a) Mediastinal structures--heart, great vessels, etc.
  - (b) Lung, pleura, bronchae
  - (c) Hemothorax
  - (d) Emphysema--superficial or mediastinal
  - (e) Pneumothorax--closed, valve type, open or sucking type.

b. Abdominal wounds:

- (1) Causes and effects for the following:

- (a) Blast
- (b) Crushing and impact
- (c) Penetrating

c. Head wounds:

- (1) Unconsciousness--Causes

- (a) Fainting
- (b) Diabetes--Insulin shock
- (c) Epilepsy
- (d) Shock
- (e) Psychosis--catatonia

- (2) Contusion
- (3) Concussion
- (4) Hemorrhage--epidural, subdural, subarachnoid, intercerebral, and interventricular.
- (5) Fractures;; Linear, depressed, and penetrating.

d. Jaw and Face Wounds

- (1) Fractures--facial bones--jaw bones
- (2) Lacerations--face, tongue, mouth, nose
- (3) Penetrating
- (4) Hemorrhage--special considerations

5. Treatment

a. Complications of wounds:

- (1) Hemorrhage
- (2) Shock
- (3) Infections
- (4) Special considerations - (special types of wounds)

b. General Measures:

- (1) Control hemorrhage
- (2) Treat shock
- (3) Prevent contamination and infection
- (4) Treat pain
- (5) Use your head

c. Specific Measures--EMT only:

- (1) Abrasion
- (2) Contusions
- (3) Incision
- (4) Laceration
- (5) Contused wound
- (6) Puncture or penetration

d. Special wounds:

(1) Chest wounds:

- (a) Flesh
- (b) Rib fractures
- (c) Vessels
- (d) Sucking
- (e) Other types--internal wounds

(2) Abdominal wounds:

- (a) Blast, crushing, impact--general supportive measures.

Training Notes:

1. Stress emergency measures in care of wounds throughout the conference.

EXAMINATIONS

(5)

1. Purpose and Scope: To conduct written tests and applicatory examinations in all subjects for the purpose of determining the training needs; evaluation of the student's progress and the final results of the training program.

2. Basic References: FM 21-5

3. Training Notes:

a. The sixteen (16) hours allocated to "Examinations" are for appropriate use by the various course directors concerned. During these hours written examinations will be conducted to determine the current status of proficiency in training.

b. Within forty-eight (48) hours after completion of each examination an alphabetical roster of grades attained by each student will be forwarded to the Academic Records Branch through normal administrative channels.

c. Officers and cadre men will be present with students during "Examinations" for assistance and maintenance of order.

d. It is expected and desired that additional examinations be given utilizing "Commander's Time" throughout the training program.



PERIOD	HOURS	WEEK	SUBJECT
1	2	1	Sterilizers: Types, Purpose, Use and Operation
2	2	2	Scrubbing Technique
3	1	2	Gown Technique
4	2	2	Glove Technique.
5	2	4	Nursing care of Fractures
6	2	4	Intravenous Technique
7	2	5	Wangensteen apparatus
8	2	5	Instruments and Utensils
9	2	5	Rubber Goods
10	2	5	Topographical Anatomy: Local Preoperative Preparation
11	2	6	Dressings, Sponges, Linen Supplies
12	1	6	Ligatures, sutures, needles
13	1	6	Spinal Puncture
14	2	7	Dressing carriage and sterile Tray
15	2	7	Wounds and Their Care
16	1	7	Use of Plaster Casts.
17	4	7	Plaster Casts
18	2	7	Operating Room Personnel and Their Various Duties
19	2	7	Operating Room Suite
20	2	7	Operating Room Proper
21	2	7	Surgical Instruments: Types, Uses, and Care

PERIOD	HOURS	WEEK	SUBJECT
22	2	8	Blood Pressure and TPR Review
23	2	8	Review of Fractures, Dislocations, Strains
24	2	8	Review of Bandaging
25	2	8	Review of Splinting
26	1	8	Miscellaneous Supplies
27	1	8	Autoclaving: Purpose, Use, Operation
27	50		TOTAL

1. Purpose and Scope: The purpose of this course is to teach the use and care of special equipment used in the hospital and to teach some of the more common procedures related to their use. The course will include classes in:

Sterilizers: Types, purposes, and use  
 Scrubbing, gloving, gowning technique  
 Nursing care of fractures  
 Intravenous technique  
 Wangensteen drainage  
 Sterilization and care of instruments and utensils and rubber goods  
 Topographical Anatomy; preoperative preparation  
 Making, packaging and sterilizing dressings and linen supplies  
 Spinal puncture  
 Preparation, use and care of dressing carriage and sterile tray  
 Typos, use and sterilization of ligatures, sutures and needles  
 Plaster casts  
 Operating Room Suite; Operating Room Proper; Operating Room Personnel and their duties  
 Types, Uses and Care of Surgical Instruments  
 Blood Pressure and TPR Review  
 Review of Fractures, Dislocations, and Strains  
 Review of Bandaging and Splinting  
 Preparation and Sterilization of miscellaneous supplies  
 Purpose, Use, Operation of Autoclave

2. Standard of Proficiency: At the completion of the course each student should:

a. Have sufficient knowledge of the special equipment demonstrated to properly use and care for it.

b. Have a practical and working knowledge of the procedures taught so that he may apply this knowledge in caring for the sick and wounded.

3. Basic References: FM 8-50; "The Principles and Practice of Nursing," Harmer and Henderson; "Surgical Nursing," Eliason, Ferguson, Farrand; "Orthopedic Nursing," Funstein and Caldewood..

First Period - Two Hours  
Sterilizers: Types, Purpose, Use and Operation

Place: Classroom

References: "The Principles and Practice of Nursing," Harmer and Henderson, Ch 7; "Surgical Nursing," Eliason, Ferguson, and Farrand, pp 557-582.

Instructional Aids:

Personnel: One man to act as demonstrator

Equipment: One autoclave; one Instrument sterilizer; materials to be sterilized.

Individual Equipment: Notebook and pencil

1st and 2d Hours - Conference and Demonstration

Points to be Covered

1. Definition of terms:

a. Sterilization: complete destruction of all micro-organisms.

b. Disinfection: destruction of pathogenic micro-organisms.

c. Antiseptic: a substance that will inhibit the growth of bacteria without necessarily destroying them.

d. Aseptic: free from infection.

e. Contamination: the presence of infectious organisms.

2. Methods of Sterilization:

a. Mechanical - Not really sterilization because it does not absolutely rid a surface of all germ life. Examples:

- (1) Scrubbing of hands
- (2) Use of filter

b. Physical - Also not really sterilization. Examples:

- (1) Sunlight - sunning mattresses
- (2) Ultraviolet rays - used for superficial infections
- (3) X-rays - used somewhat as ultraviolet rays

c. Chemical - Use of chemicals as germicides.

(1) Uses:

- (a) Application to skin or tissues to prevent infection. Examples: Tr. Iodine  $3\frac{1}{2}\%$ , Tr. Merthiolate.
- (b) Sterilization of instruments or materials which cannot be sterilized by heat, e.g., scalpels, cystoscopes, hard rubber catheters, etc. Examples of solutions:

- 1. Alcohol 70%
- 2. Phenol 2%
- 3. Army Sterilizing Solution

(2) Important Factors in Chemical Sterilization:

- (a) Choice of solution--choose solution to suit article to be sterilized.
- (b) Strength of solution--best germicidal strength to be used.
- (c) Complete immersion of article in solution.
- (d) Time--leave article completely immersed for minimum time required for sterilization--varies with solution.

d. Thermal (sterilization by heat)

(1) Dry heat

- (a) Open flame--used occasionally in emergency sterilization of scalpels, needles, etc.
- (b) Cautery--used to sterilize cut tissues.
- (c) Hot air oven--used for materials such as vaselin in bulk, bone wax, talcum powder in bulk which cannot be properly sterilized by any other method. Material is kept in oven at 300 to 320 degrees F for not less than one hour.

(2) Moist heat

- (a) Boiling water (212 degrees F)--Article should be completely submerged in boiling water for not less than 10 minutes to kill all organisms. 15 to 20 minutes may be required.

- (b) Steam at atmospheric pressure--used for fractional sterilization. Articles kept in sterilizer for 20 to 30 minutes or three successive days. This enables spores to develop into vegetative or active form and be killed during heatings which follow.
- (c) Steam under pressure--most useful method for nearly all surgical supplies. The sterilizer or autoclave is built so that steam enters the chamber under pressure which should be maintained at a maximum of 15 to 20 lbs. The minimum time for sterilization is 13 minutes.

### 3. Types (Most frequently used in hospitals)

- a. Boiling water sterilizer: (Instrument sterilizer, utensil sterilizer, and basin sterilizer - so named because of size).

#### (1) Example: Instrument sterilizer

- (a) Used for small instruments which can be boiled.
- (b) Operation (Demonstration)

1. Fill sterilizer 3/4 full of distilled water.
2. Turn on current.
3. When boiling point is reached, place instruments on tray, close lid of sterilizer, and start timing.
4. Do not open sterilizer during timing period.
5. At end of 10 minute period, turn off current, raise lid of sterilizer.
6. Remove sterile instruments to sterile surface with sterile lifting forceps.

#### (c) Care of sterilizer:

1. Clean daily
  - a. Drain off water
  - b. Scrape off sediment
  - c. Remove sediment by washing with water and refill sterilizer.

#### b. Steam under pressure (Autoclave)

- (1) Used for sterilizing most large equipment as packs, flasks of solution, linen, etc.
- (2) General Principles:

- (a) Only authorized person to operate an autoclave.

- (b) Efficiency of sterilizing process of autoclave is dependent on complete penetration by steam. Sterilize dry packages and liquids in separate loads.
- (c) Dry articles to be sterilized must be carefully wrapped in muslin or other wrapper.
- (d) Liquids must be carefully stoppered to prevent contamination by condensed steam at end of sterilizing process.
- (e) Muslin wrapped articles must dry before door is opened.
- (f) In sterilizing fluids temperature inside autoclave must be allowed to drop below boiling point before door is opened to prevent flasks from boiling over and contaminating stoppers.
- (g) Do not stand in front of door when opening autoclave.

(3) Operation. To be demonstrated in period #27.

Training Notes:

1. Stress difference in meaning of terms "sepsis" and "asepsis."
2. Stress difference in meaning of terms "clean" and "sterile."
3. Stress difference in meaning of terms "disinfection" and "sterilization."
4. Stress points at which sterilizing time is completed.
5. Stress that only an authorized person may operate an autoclave.

Second Period - Two Hours  
Scrubbing Technique

Place: Classroom

References: "Surgical Nursing," Eliason, Ferguson, and Farrand, 6th Ed, pp 610-614.

Instructional Aids:

Personnel: One man as demonstrator; One man to supervise each six students in application.

Equipment:

- 1 Scrub-up unit with running water
- 1 Surgeon's scrub suit
- 1 mask
- 1 sterile basin package
- 1 bottle antiseptic solution (1000cc)
- 1 package with 2 sterile scrub brushes

1 package with 1 sterile towel  
 1 package sterile rubber gloves  
 1 package sterile glove powder  
 1 bar hand soap  
 2 sterile orange wood sticks  
 1 clock for timing  
 1 cap  
 1 stand for splash basin

Individual Equipment: Each student:

Notebook and pencil  
 1 cap  
 1 package with 2 sterile scrub brushes  
 1 package with 1 sterile towel  
 1 package sterile rubber gloves  
 1 package sterile glove powder  
 2 sterile orange wood sticks  
 1 surgeon's scrub suit  
 1 mask  
 1 bar of soap

Each group of six students:

1 scrub-up unit with running water  
 1 stand for splash basin  
 1 sterile basin package  
 1 bottle antiseptic solution (1000 cc)

3d and 4th Hours - Conference, Demonstration, Application

Points to be Covered

1. Introduction and Explanation:

a. Definition: "Scrubbing up" is the cleansing of the hands and arms for a procedure in which aseptic technique is used.

b. Indications for scrubbing up:

- (1) For operations in the OR
- (2) For some procedures on the ward, such as catheterization, changing certain types of dressings, specific procedures where danger of infection is great.

c. Objectives in scrubbing up:

- (1) To make the hands as clean as possible. Scrub up will not sterilize the hands but it will remove most infective organisms.

(2) To protect the patient.

2. Preparation for scrubbing up (Demonstrate)

a. Care of finger nails:

- (1) Nails should be cut short with no rough edges.
- (2) Nails should be reasonably clean.

b. Remove jewelry

c. Clothing to be worn:

- (1) Preferably a surgeon's scrub suit. If scrub suit is not available the shirt may be removed and just trousers and undershirt worn.
- (2) Cap should be worn so that all hair is tucked under it. No loose hairs should be in evidence. Hairs falling on a sterile field will contaminate it.
- (3) Mask should be worn covering mouth and nose. This is to prevent droplets of infection caused by talking, coughing, or sneezing from reaching the sterile field.

d. Prepare splash basin. This is a sterile basin containing antiseptic solution to be used as a hand dip after scrubbing.

- (1) Place wrapped sterile basin on basin stand.
- (2) Open package and drape wrapper over stand without contaminating inside of wrapper.
- (3) Pour solution - 70% alcohol is preferred.

e. Open sterile packages

- (1) Brushes
- (2) Towels
- (3) Gloves and glove powder

3. Procedure (Demonstrate)

a. Adjust water to proper flow and temperature.

b. Pick up soap. Until scrub up is finished soap does not leave the hands. If soap is dropped a new bar should be taken--do not pick it up from sink and continue scrubbing.

c. Begin timing at moment you begin scrub - not before.

- (1) A ten minute sand timer may be used.
- (2) A clock is preferred.
- (3) Time of scrub:

- (a) Without brush, 2 minutes
- (b) With brush, 8 minutes
- (c) Total 10 minutes.

d. Wash the hands, arms and elbows with soap and water to a level about two inches above the elbow. Rinse hands and arms frequently and re-soap throughout the scrub.

e. Rinse by moving first the hand and then the arm under the running water. Always hold the hand at a higher level than the elbow so that water from above the elbow will not run back over the scrubbed area causing contamination.

f. Pick up hand brush after two minutes and start scrub with brush.

- (1) Scrub vigorously reaching all surfaces of both hands, arms, elbows. Rinse and re-soap frequently. Spend approximately 2 minutes on each extremity concentrating most on the hands and nails. Drop brush in sink.
- (2) Clean lightly the under surface of the nails and around the cuticle with sterile orange stick; use a different orange stick for each hand and drop them in the sink after using.
- (3) Pick up second sterile brush and continue scrub as before spending approximately 2 minutes on each hand to complete the 10 minute scrub. Drop brush in sink.
- (4) After final thorough rinsing turn off water if there is a knee pedal. If not ask the circulating nurse to turn it off for you.

g. Rinse hands in splash basins:

- (1) Holding hands higher than elbows walk to splash basin. Touch nothing with hands and arms.
- (2) Rinse hands in antiseptic solution in splash basin. Splash solution over wrists and lower forearm. Hold hands completely immersed in the solution, palms down on bottom of basin. Time for antiseptic rinse is approximately one minute.
- (3) Dry the hands.
  - (a) Use sterile towel from gown package or separate towel package. Pick up towel from opened package with tip of fingers of right hand.
  - (b) Open towel and dry the left hand and then the left forearm. Blot, do not rub, and use only one surface of the towel.
  - (c) Transfer towel to left hand folding it in half so that used surface is on the inside.

(d) Dry right hand and forearm and discard towel.

h. Powder hands with sterile glove powder.

**4. Application:**

a. Each student should prepare for scrub up and do scrub up as demonstrated.

**Training Notes:**

1. Stress completing preparation for scrubbing up before starting to scrub.

2. Emphasize timing actual scrubbing time accurately.

3. Emphasize care in not contaminating self during scrub or following scrub.

4. Supervise applicatory phase closely.

**Third Period - One Hour**  
**Gown Technique**

**Place:** Classroom

**References:** "Surgical Nursing," Eliason, Ferguson, and Farrand, 6th Ed., pp 610-614.

**Instructional Aids:**

**Personnel:** Two men to act as demonstrators; one man per six students to supervise applicatory phase.

**Equipment:** 1 sterile gown pack  
1 cap  
1 mask  
1 table (small size on which to open pack)

**Individual Equipment:** Each student:

Notebook and pencil  
1 sterile gown pack  
1 cap  
1 mask

Tables as needed on which to open packs.

**5th Hour - Conference, Demonstration, Application**

**Points to be Covered**

1. Introduction and Explanation:

a. Purpose of wearing a sterile gown is to present a sterile outer surface of those parts of the body which come in contact with the sterile field during an operation or any other aseptic procedure.

b. Brief explanation of folding a gown.

2. Demonstration:

a. Open sterile gown pack on table.

b. Put on sterile gown (One man to assist demonstrator, acting as circulating technician).

3. Procedure:

a. Preparation:

- (1) Cap and mask put on and adjusted.
- (2) Surgical "scrub up" (This may be omitted from demonstration and application)

b. Steps in putting on sterile gown:

- (1) Pick up gown and move back away from table.
- (2) Holding gown by inside of neck permit gown to unfold with inside of gown toward you.
- (3) Slide first one hand and then the other into the sleeves part way and then hold arms out in front of you touching no part of the gown except inside of sleeve with hands.
- (4) Circulating technician grasps the inside or margin of the back and tugs the gown on.
- (5) Circulating technician ties neck and waist strings.
- (6) Belt is grasped at its lower end by circulating technician, first one side, then the other, and tied in back. Scrub technician may bend forward slightly to swing belt free of gown to assist circulating technician.

c. Precautions:

- (1) Do not touch outside of gown until hands are gloved.
- (2) Always keep hands above waist.
- (3) If gown is accidentally contaminated discard it and put on another sterile gown.
- (4) Only the front of the gown above the waist and sleeves are considered sterile after putting on the gown.

4. Application:

a. Students acting in teams of two will put on sterile gown each in turn acting as scrub technician and circulating technician.

Training Notes:

1. Supervise applicatory phase closely. Correct breaks in technique as they occur.

2. Stress importance of recognizing and correcting breaks in technique.

Fourth Period - Two Hours  
Glove Technique

Place: Classroom

References: "Surgical Nursing," Eliason, Ferguson, and Farrand, 6th Ed, pp 610-614.

Instructional Aids:

Personnel: One man as demonstrator; one man to supervise each six students in application.

Equipment: 2 glove cases 2 pkgs glove powder  
2 prs rubber gloves size 7 $\frac{1}{2}$  or 8 1 table (small)

Individual Equipment: Each student:

Notebook and pencil 1 pr rubber gloves  
1 glove case 1 pkg glove powder

Tables as needed for glove cases

6th and 7th Hours - Conference, Demonstration, Application

Points to be Covered

1. Introduction and Explanation:

a. Glove technique is the method of putting on sterile gloves without contamination, for a procedure used in surgical asepsis.

b. Indications for wearing:

- (1) Aseptic procedures in the OR.
- (2) Procedures on wards as indicated, for example: changing certain types of dressings; some procedures as catheterization; spinal tap.

c. Object in wearing the gloves: Protect patient from infection from the hands.

2. Demonstration:

a. Demonstrate packaging of rubber gloves for sterilization including explanation of glove case, and glove powder.

b. Demonstrate opening sterile package of gloves.

c. Demonstrate method of removing sterile gloves from package and putting on gloves.

d. Demonstrate assisting other members of operating team to put on gloves.

3. Procedures:

a. Putting on sterile rubber gloves:

- (1) With left hand lift fold of case from right glove.
- (2) Take glove powder from case without touching glove.
- (3) Powder hands.
- (4) With left hand lift fold of case from right glove.
- (5) With right hand pick up right glove with finger tips touching only inside of glove on folded back part of cuff.
- (6) Transfer glove to left hand grasping it only on inside of glove on folded back cuff.
- (7) Slide right hand into glove, pulling it on with left hand.
- (8) Slide finger tips of right glove hand under folded back cuff of left glove and remove glove from case (Touch only outside of glove)
- (9) Slide left hand into glove pulling it on with fingers of right hand anchored in folded back cuff of glove.
- (10) Pull cuffs of gloves over sleeve cuffs of gown taking care to touch only outside of cuff.

b. Assisting others to put on sterile gloves:

- (1) Empty powder from package into palm of person to put on gloves.
- (2) Pick up right glove and place finger tips of both hands under folded back cuff.
- (3) Stretch cuff of glove slightly from side to side and hold in position for person to put hand in glove with a quick downward thrust of hand. (Thumb on side toward person putting on glove).
- (4) Fold cuff of glove up over cuff of gown.
- (5) Repeat for left glove.

4. Application:

- a. Each student opens sterile package of glove.
- b. Each student puts on sterile gloves.
- c. Each student assists another student to put on sterile gloves.

Training Notes:

1. Stress touching only inside of glove with ungloved hand.
2. Stress touching only outside of glove with gloved hand.
3. Emphasize importance of recognizing and correcting breaks in technique of accidental contamination of gloves.
4. Emphasize importance of discarding torn gloves and obtaining another sterile glove.

Fifth Period - Two Hours  
Nursing Care of Fractures

Place: Classroom

References: "Orthopedic Nursing," Funstein and Caldewood, Units 2 and 6.

Instructional Aids:

Personnel: One man to direct conference and demonstration; one man to act as patient

<u>Equipment:</u>	1 patient unit	1 roll bandage, elastic self adherent
	1 hip spica cast shell	Rope, weights, etc.
	1 pr fracture boards	1 small bottle alcohol
	1 Balkan frame, complete	1 box powder
	8 sheets	1 bed pan
	1 rubber draw sheet	1 bed pan cover
	3 pillow cases	1 roll toilet paper
	2 extra pillows	1 pair crutches
	3 blankets	1 cane
	1 tray, food	1 roll 2" adhesive
	1 Thomas splint with Pearson attachment	

Individual Equipment: Notebook and pencil

8th and 9th Hours - Conference and Demonstration

Points to be Covered

## 1. Introduction:

a. The orthopedic patient - Injuries or disease of the bones or joints.

b. Reasons for special care:

- (1) Hospitalized for a long period of time.
- (2) Confined to bed for long periods.
- (3) Appliances used on orthopedic patients make movement difficult or impossible.

## 2. Explanation (Demonstrate)

a. Nursing care of patients in traction

(1) Immediate post-operative care (in addition to usual care)

- (a) Assist doctor in fixing ropes, applying weights, etc.
- (b) In moving patient have sufficient help.

(2) Daily Care

(a) Bathing patient

- 1. Assist as needed.
- 2. Limb in traction bathed daily.
- 3. Back bathed daily.

(b) Care of the skin - prevent bed sores.

- 1. Bath daily
- 2. Keep bed linen dry, free from wrinkles.
- 3. Rub back frequently and well (Demonstrate)

- a. Examine base of spine.
- b. Dry thoroughly.

4. Special attention to possible pressure points.

(c) Changing and making bed (Demonstrate)

- 1. Bottom covers dry and free from wrinkles.
- 2. Patient well covered and warm.
- 3. No weight of bed covers on traction.

(d) Care of traction:

1. Avoid slipping - examine knots and adhesive frequently.
2. Weights hang free
3. No weights removed except by order of doctor.

(e) Elimination:

1. Feces

- a. Use of bed pan (Demonstrate)
- b. Check daily - notify nurse if no B.M.; order is needed for laxative or enema.

2. Urine

- a. Note voiding post operatively
- b. Output chart if ordered.

(f) Feeding

1. Nourishing diet
2. Assist as needed.

(g) Circulation

1. Signs of poor circulation

- a. Pain
- b. Coldness
- c. Pallor of part
- d. Cyanosis
- e. Swelling
- f. Numbness

2. Caution - avoid constricting bandages, tight towel under part, etc.

3. Treatment for poor circulation

- a. Notify nurse
- b. Never remove weights, loosen tape, etc. unless ordered by doctor.

(h) Care of wounds:

1. Dressing changed as ordered by doctor.
2. Increase in drainage, odor or pain - notify nurse.

(i) Exercise (Demonstrate)

1. Passive - operator performs motion without assistance from patient.

- 2. Assistive - patient performs motion assisted by operator.
- 3. Active - patient performs exercise.
- 4. Resistive - patient performs exercise resisted by operator or machine.

b. Nursing care of Patients in Casts - (Demonstrate using Hip Spica shells)

(1) Immediate post-operative care (in addition to usual post-operative care)

(a) Moving patient to bed:

- 1. Care to avoid cracking cast - use palm of hand, not finger tips.
- 2. Well supported.

(b) Observe signs of poor circulation

1. Symptoms:

- a. Pain
- b. Coldness
- c. Pallor of part
- d. Cyanosis
- e. Swelling
- f. Numbness

2. Treatment:

- a. Notify nurse
- b. Never cut cast - done by doctor or plaster room technician.

(c) Care of wet cast:

- 1. Moving patient - sufficient help to avoid cracking or denting.
- 2. Drying cast:

- a. Bakers
- b. Lamps
- c. Fans
- d. Uncover and air dry

3. Support well with pillows

(2) Daily care:

(a) Bathing patient:

1. Daily bath
2. Assist as needed
3. Bathe fingers and toes of part in cast daily

(b) Changing bed (Demonstrate)

(c) Elimination:

1. Feces

- a. Use of ped pan - (demonstrate)
- b. Check daily - notify nurse if no B.M.

2. Urine

- a. Note voiding post-operatively
- b. Output chart if ordered

(d) Care of skin:

1. Frequent bathing
2. Clean well under cast edges
3. Pressure points - well padded, note complaints  
odor under cast

(e) Feeding:

1. Feed if necessary
2. Prepare food so patient can feed self if  
needed.
3. Encourage patients to eat

(f) Care of wounds:

1. Watch for hemorrhage - increase in bright red  
blood on cast.
2. Dressings - window cut in cast after cast dries.
3. Infection - note odor

(g) Moving patient - turn frequently

1. Comfort of patient - support with pillows.
2. Safety of patient.
  - a. Pressure sores
  - b. Hypostatic pneumonia

(h) Occupational therapy

(3) Following removal of cast:

- (a) Special care of the skin - oil and clean well.
- (b) Support part with pillows
- (c) Exercise part - physiotherapy.

b. Nursing Care of Ambulatory Patient:

(1) Assist as needed:

- (a) Feeding
- (b) Dressing
- (c) Bathing, etc

(2) Walking aids (Demonstrate)

- (a) Cane
- (b) Crutches - support weight with heel of hands
- (c) Walkers on casts

Training Notes:

1. Set up patient unit and apply skin traction for fractured femur before class begins.
2. Stress importance of bathing limb in traction or toes or fingers of limb in cast.
3. Emphasize the prevention of bed sores.
4. Stress value of occupational therapy for the orthopedic patient.
5. Demonstrate each step carefully as it is explained.

Sixth Period - Two Hours  
Intravenous Therapy

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, Chapter 27.

Instructional Aids:

Personnel: One man to direct conference and demonstration; one man per eight students to supervise applicatory work.

Equipment: One I.V. set, complete      1 bedside table  
                   2 bottles I.V. fluids      1 I.V. standard  
                   1 jar alcohol sponges      1 roll adhesive, 2"  
                   1 tourniquet              1 basin, pus

Individual Equipment: Notebook and pencil

1 set of equipment per two students:

1 I.V. set	2 bottles I.V. fluid
1 I.V. standard	1 basin, pus
1 bedside table	

10th and 11th Hours - Conference, Demonstration and Application

Points to be Covered

1. Introduction:

a. Definition - The introduction of fluids into a vein.

b. Importance to technician:

- (1) This is a very common procedure on the wards.
- (2) Frequently the technicians responsibility to:

- (a) Prepare the equipment
- (b) Assist the doctor in starting the treatment.
- (c) Care for patient and equipment during treatment.
- (d) Care for equipment following treatment.

2. Explanation:

a. Uses of I. V. fluids:

- (1) To supply the body with fluids when the patient is unable to take adequate amount by mouth.
- (2) To supply the body with salts of the tissue fluid, chiefly sodium chloride, when the patient is unable to take an adequate supply by mouth.
- (3) To supply the body with food in the form of glucose and vitamins when the patient is unable to take adequate supply by mouth.
- (4) To add to the amount of circulating fluids in conditions such as hemorrhage.
- (5) To bring about alterations in vascular pressure by the introduction of hypertonic solutions.

b. Usual sites for injection:

- (1) Inner surface of elbow.
- (2) Inner side of ankle.

3. Demonstration:

a. Demonstrate equipment used:

- (1) Sterile I.V. set

(a) Usually obtained from Central Service  
 (b) Items:

1. Rubber tubing with glass connections and murphy drip  
 2. Needles  
 3. Hoffman clamps

(2) Tourniquet

(3) Fluids as ordered by the doctor:

(a) Normal saline  
 (b) 5-10% glucose in normal saline.  
 (c) 5-10% glucose in distilled water.  
 (d) Other special preparations.

(4) I.V. standard or pole

(5) Alcohol sponges

(6) Adhesive tape

b. Demonstrate setting up equipment for use:

(1) Place I.V. standard at head of bed on side of arm to be used. (At foot, if ankle is to be used).  
 (2) Open I.V. set on bedside table; unfold outside wrapper to make sterile cover for table top.  
 (3) Remove metal cap and then rubber covering from top of bottle of fluid to be given.  
 (4) Using long needle puncture holes in rubber stopper at site of indentation not connected to glass tube on inside of stopper.  
 (5) Insert same needle through other indentation in stopper into glass tube.  
 (6) Insert glass connecting tube into stopper at site previously punctured by needle.  
 (7) Place Hoffman clamp on rubber tubing between bottle and Murphy drip and close clamp.  
 (8) Hang bottle on standard leaving end of tubing in sterile area.  
 (9) Cut four strips of adhesive  $\frac{1}{2}$ " by 4".  
 (10) Prepare patient for treatment.

(a) Attend to needs of patient such as bedpan, urinal, etc.

(b) Make patient comfortable in a position convenient for the treatment.

(11) When doctor is ready to give treatment:

(a) Place tourniquet under arm.

- (b) Clean area with alcohol sponge.
- (c) Assist doctor as needed.
- c. Demonstrate regulation of flow.
- d. Demonstrate change of bottles.
- e. Demonstrate discontinuing treatment.
- f. Demonstrate care of equipment:
  - (1) Remove all equipment from bedside.
  - (2) Rinse tubing and needles with cold water.
  - (3) Place parts of I.V. set in wrapper to be returned to Central Service.
  - (4) Return other equipment to proper place. Empty solution bottles are taken to medical supply.

4. Application:

- a. Divide students into groups of four:
  - (1) Students practice setting up equipment.
  - (2) Students practice regulation of flow.
  - (3) Students practice change of bottles.
  - (4) Students practice care of equipment after treatment.

Training Notes:

1. Emphasize setting up of equipment before the doctors arrival.
2. Emphasize watching solution level in bottle preparatory to changing bottle of solution or discontinuing treatment.
3. Stress constant observation of arm while treatment is in progress for evidence of fluid in the tissues.

Seventh Period - Two Hours  
Wangensteen Apparatus

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, Chapter 30.

Instructional Aids:

Personnel: One man to direct conference and demonstration

Equipment: Non-standard working model of Wangensteen set-up  
Wangensteen apparatus modified, complete.

4 - 1 gallon bottles with two hole rubber stopper  
 18 ft red rubber tubing  
 4' glass tubing  
 1 levin tube  
 1 Miller-Abbott tube  
 1 I.V. standard  
 1 patient unit, complete with linon

Individual Equipment: Notebook and pencil

12th and 13th Hours - Conference, Demonstration

Points to be Covered

**1. Introduction:**

a. Definition - The contents of any body cavity may be drawn from it by the application of negative pressure or "suction." Negative pressure or "suction" is caused by the existence of a partial vacuum. The efficiency of the apparatus is dependent upon the maintenance of a partial vacuum that has a sufficiently strong pulling force to draw out the contents of the cavity. The suction apparatus used for drainage of the stomach and small intestines is a form of water suction. The Wangensteen is the most commonly used apparatus for this purpose in Army hospitals.

b. Importance to technician - It is usually the technicians responsibility to:

- (1) Assemble and prepare the equipment.
- (2) Assist the doctor in starting the treatment.
- (3) Care for the patient and equipment while apparatus is in use.
- (4) Care for equipment when treatment is discontinued.

**2. Explanation**

a. Uses:

- (1) To remove gas and fluid from the gastro intestinal tract post-operatively, thereby preventing or relieving distention.
- (2) To relieve a patient with intestinal obstruction or discomfort due to gas and fluid in the gastro-intestinal tract.

b. Care of Patient:

- (1) Explain purpose of treatment and results to be expected.
- (2) During treatment:

- (a) Keep bed clean and dry
- (b) Frequent mouth wash or cracked ice.
- (c) Watch for signs of irritation from adhesive straps on cheek.

c. Types of tubes used:

- (1) Levin tube, a straight single lumen stomach tube.
- (2) Miller-Abbott tube, a double lumen tube with bulb on end. Bulb stimulates intestinal movement.

3. Demonstration:

a. Demonstrate non-standard working model of Wangensteen set-up. See diagram for principles of operation.

b. Demonstrate setting up the Wangensteen apparatus and starting treatment.

c. Demonstrate care of equipment during use.

d. Demonstrate care of equipment after treatment is discontinued.

4. Procedure:

a. To start treatment:

(1) Assemble equipment at bedside.

- (a) Place stomach tube in basin of ice.
- (b) Set up apparatus ready for use.

1. Wangensteen apparatus modified is usually available from Central Service already set up. Drainage bottle must be set up with two hole rubber stopper, glass tubing and rubber tubing.

2. Improvised Wangensteen apparatus set up as follows:

- a. Improvised suction bottles: 2 one gallon bottles, rubber tubing, two hole rubber stoppers, glass tubing.
- b. Drainage bottle with two hole rubber stopper, glass tubing and rubber tubing.
- c. I.V. Standard

(c) Hoffman clamps

(2) Assist doctor as needed to insert stomach tube. (Tube

(3) is inserted through nose as for gastric gavage)

(3) Test for suction by putting glass connecting tube which is to be attached to the stomach tube in a glass of water. Water should flow into drainage bottle. After suction is established clamp off tube.

(4) Attach stomach tube to tube from drainage bottle. Remove clamp from tube.

(5) Hold stomach tube in place by use of small adhesive strips on cheek beside nose and just below temple.

(6) Pin rubber tubing from drainage bottle to sheet and mattress at side of bed.

(7) Test for suction: Compress tubing from patient to drainage bottle and flow of water between the two suction bottles will stop if there is suction.

b. Care of equipment during use:

(1) Change suction bottles as often as necessary to keep upper bottle from becoming empty, clamp off tubing between the two bottles and the tubing to the drainage bottles while changing bottles.

(2) If stomach tube becomes clogged disconnect it and irrigate it or apply increased suction with a syringe.

(3) Empty drainage bottle as ordered by doctor:

- (a) Measure contents
- (b) Note character and color of contents
- (c) Wash bottle before replacing it.

c. Care of equipment when treatment is discontinued:

(1) Doctor removes stomach tube slowly and gently.

(2) Disconnect bottles and tubes and wash thoroughly.

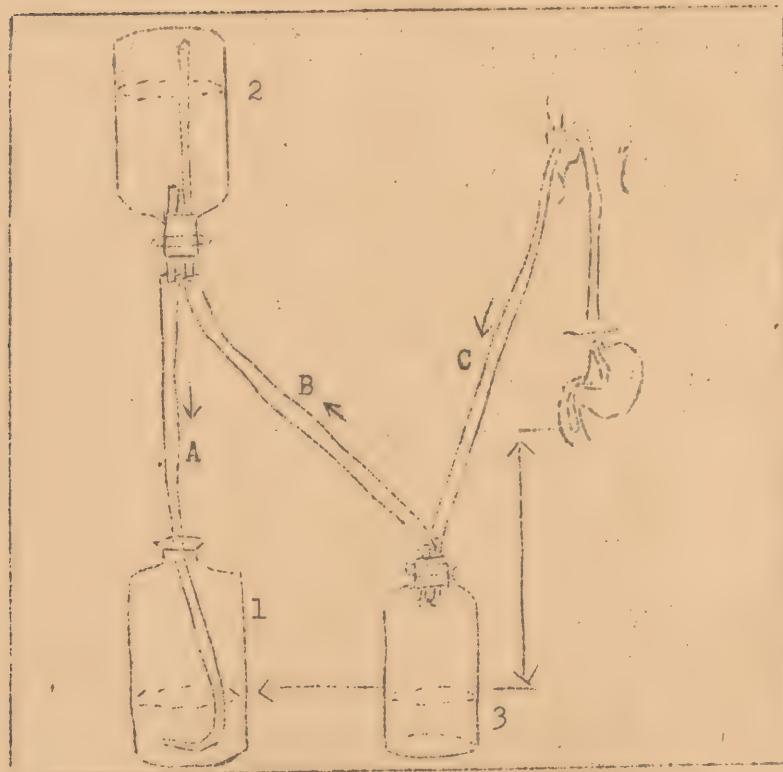
(3) Boil parts of equipment which was in contact with drainage from the patient.

(4) Return equipment to Central Service.

Training Notes:

1. Emphasize duties of technician in setting up equipment and caring for equipment during use.
2. Emphasize care of the patient.
3. Stress thorough cleansing of equipment when treatment is discontinued.

Wangensteen Apparatus Diagram



Water flows from bottle #2 to bottle #1 through tube A thus creating a partial vacuum in bottle #2. Because of the partial vacuum in bottle #2 air is forced from bottle #3 through tube B thus creating a partial vacuum in bottle #3. The partial vacuum in bottle #3 acts as a suction to draw gas and liquid out of the stomach through tube C.

Eighth Period - Two Hours  
Instruments and Utensils, Sterilization and Care

Place: Classroom

References: "Surgical Nursing," Eliason, Ferguson, Farrand, 6th Ed, pp 586-591, 594-595.

Instructional Aids:

Personnel: One man to direct conference; one man to act as demonstrator; one man to supervise each group of 20 students.

<u>Equipment:</u>	Instruments from basic set	Muslin wrappers
	Hand brush	Cotton applicators
	Sink with running water	Army sterilizing solution
	Enamelware as available	Autoclave
	Glassware as available	Gauze sponges (4x4)
	Cresol	soap
	Alcohol 70%	
	Boiling water sterilizers (large and small)	

Individual Equipment: Notebook and pencil

14th and 15th Hours - Conference, Demonstration

Points to be Covered

1. Introduction:

a. The proper sterilization of instruments and utensils is very important because of danger of infection to the patient if they are not properly sterilized. The proper care of this equipment is necessary to insure best working condition and long life of the equipment.

2. Instruments

a. Metal instruments:

(1) Sterilization:

(a) Autoclaving is the most efficient means of sterilization. If time and facilities are available this method is used in preference to any other. This method is often used for the initial sterilization of instruments for an operation, boiling being used for subsequent sterilizations after the instruments have been used.

- (b) Boiling in water for 15 to 20 minutes will efficiently sterilize instruments. The instruments should be placed on a perforated tray to prevent their becoming overheated by contact with the bottom of the sterilizer. Instruments must be completely covered with water and should not be placed in the sterilizer until the water is boiling.
- (c) Chemical sterilization is not frequently used for instruments found in the basic set except for cutting instruments and needles. Army sterilizing solution is usually the solution of choice. Complete immersion in this solution for not less than 30 minutes should be used. Never use Bichloride of Mercury solution to sterilize any metal instrument as it corrodes metal.

(2) Care of instruments after use:

- (a) If used on a dirty case soak for 10 to 15 minutes in 5% solution of cresol before scrubbing. After thorough cleansing boil for 10 minutes or longer.
- (b) Routine cleansing:
  1. Remove blood with cold water
  2. Thoroughly scrub with a brush under lukewarm running water. Pay particular attention to teeth, crevices, joints. Fine cleansing powder or soap may be used to remove spots; sand soap will remove nickel or chrome plating so should not be used.
  3. After thorough cleansing with soap and water, rinse in hot water and dry immediately. Open forceps and dry well around the joints. If joints seem stiff a drop or two of mineral oil should be put in the joint before putting the instrument away.

b. Cutting instruments:

(1) Sterilization:

- (a) Autoclaving is again the method of choice except for very delicate cutting instruments such as cataract knives.
- (b) Repeated and prolonged boiling dulls cutting instruments. If boiling is the only method available the points or sharp edges must be protected.
- (c) Chemical sterilization is frequently used for cutting instruments. Complete immersion of the instrument is essential. The length of time varies with the solution used but is seldom less than 30

minutes. Army sterilizing solution is the one most frequently used in the army but alcohol 70% may be used.

( 2 ) Care after use:

- ( a ) The aftercare of cutting instruments is essentially the same as for other metal instruments.
- ( b ) All cutting instruments should be tested after use to determine whether or not they need sharpening.
- ( c ) Special instruments such as cystoscopes and proctoscopes contain delicate lenses and cannot be sterilized by heat. They require special care which should be done under supervision of someone who thoroughly understands the structure of the instrument.

3. Utensils

a. Enamelware:

( 1 ) Sterilization:

- ( a ) Enamelware may be wrapped and autoclaved.
- ( b ) Boiling in the utensil sterilizer for 30 to 45 minutes depending on the number of basins and how tightly they are packed in the sterilizer is a frequent method. After the required period of boiling the water should be drained out of the sterilizer and the drain closed again. After sterilization nothing can be removed from the sterilizer except by use of sterile forceps or the sterile gloved hand of one who is "scrubbed up."

( 2 ) Care of enamelware:

- ( a ) If contaminated they may first be completely immersed and soaked in 5% cresol solution and after thorough scrubbing, boiled.
- ( b ) Routine care consists of thorough scrubbing, scouring if necessary. Enamelware should be thoroughly rinsed and dried before being put away.

4. Glassware

a. Sterilization:

- ( 1 ) Most syringes, glass graduates, etc may be carefully

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- (2) wrapped and autoclaved and stored until used.
- (2) In boiling glassware care should be taken not to heat or cool the glass too rapidly. Syringes having rubber pistons or detachable metal parts should not be boiled.
- (3) Chemical sterilization is frequently used. The solution of choice is alcohol 70% for not less than 30 minutes.

b. Care after use:

- (1) Separate parts of syringe immediately after use.
- (2) Wash off blood with cold water from all glassware.
- (3) Wash thoroughly in soap and water and rinse in clear water and dry.
- (4) Glassware may be put away until needed or resterilized and stored.

5. Demonstration: Demonstrate care after use and preparation for sterilization of:

- a. Different types of metal instruments.
- b. Cutting instruments -- scissors, knives.
- c. Enamelware -- basin, pitcher.
- d. Glassware -- syringe, glass graduate.

Training Notes:

- 1. Stress importance of proper care of instruments and utensils in prolonging their life.
- 2. Emphasize methods of sterilization for each type of equipment demonstrated.

Ninth Period - Two Hours  
Rubber Goods, Sterilization and Care

Place: Classroom

References: "Surgical Nursing," Eliason, Ferguson, Farrand, 6th Ed, pp 591-595

Instructional Aids:

Personnel: One man to direct conference; one man to demonstrate; One man for each ten students in application.

Equipment: 1 pair rubber gloves                      glove powder  
                  1 tube rubber cement                      1 can of ether ( $\frac{1}{4}$  lb)

Sink with running water	Glove case
Plain rubber tubing	1 glass test tube
Penrose tubing	Soap
Muslin wrappors	Rubber dam
1 package sterile towels	Gauze squares 4 x 8
1 pr scissors	2 soft rubber catheters
1 long covered basin	1 forceps, sponge
Sterile water in flask	2 hard rubber catheters
1 old rubber glove for patches	Sterilizing solution
2 large basins	

Individual Equipment: Notebook and pencil

1 old rubber glove for patches	1 glove case
1 pair rubber gloves	1 glass test tube
For each five (5) students:	
1 tube rubber cement	1 can of ether ( $\frac{1}{4}$ lb)
1 large basin	Glove powder
	Glove case

16th and 17th Hours - Conference, Demonstration, Application

Points to be Covered

1. Introduction

a. Rubber goods require special care and special consideration in sterilization. The life of the equipment depends largely on its proper care. Aseptic technique is interfered with if such articles are not properly sterilized. Thus it is obvious that for economy and welfare of the patient knowledge of the care and sterilization of different articles made of rubber is essential. Only such rubber goods as require sterilization will be considered.

2. Explanation:

a. General rules of sterilization:

- (1) Articles of hard rubber cannot be boiled. They must be sterilized by chemical sterilization.
- (2) Soft rubber articles may be boiled but should never be boiled in water to which washing soda (sodium carbonate) has been added. A teaspoonful of table salt to a quart of water helps to preserve the rubber. Rubber should not be boiled longer than five minutes.
- (3) Rubber tubing, drainage tubes, rubber dam may be best sterilized by autoclaving.

b. General rules of care:

- (1) Rubber deteriorates and must always be tested before use.

- (2) After use rubber goods should be thoroughly washed and rinsed well and dried before putting it away.
- (3) Acid corrodes rubber.
- (4) Oil and grease partially dissolve rubber.
- (5) Metal instruments and soft rubber should never be boiled together as the instruments will become discolored.

c. Intravenous tubing requires very special attention because of its use. If tubing is not properly cared for patients receiving intravenous therapy may have violent reactions usually manifested by chills and fever.

- (1) Preparation of new tubing for use is directed toward removing all traces of preservative from the tubing. The routine may vary but meticulous care is always the rule. It involves special processes of washing, rinsing and boiling. In each department preparing new intravenous tubing, typewritten instructions are available and must be followed.
- (2) After use the preparation of intravenous tubing for re-use is not as involved but attention to detail is just as important. It is directed mainly toward rinsing all traces of the intravenous solution used from the tubing.

### 3. Demonstration:

#### a. Rubber gloves:

##### (1) Testing for holes:

- (a) Inflate glove well with air, the air confined by firmly grasping the edges of the cuff.
- (b) Test each finger individually by forcing sufficient air into it to stretch it slightly and hold it close to the cheek to feel escape of air through any holes present.
- (c) Test body of glove in same manner. Air from fingers may be forced into the body of the glove to inflate it sufficiently to stretch it slightly.

##### (2) Mending rubber gloves:

- (a) Gloves to be mended must be clean and dry.
- (b) Cut patches to match the holes from strong parts of old rubber gloves.
- (c) Clean area around the hole with ether. This makes the patch stick better.
- (d) Apply a small amount of rubber cement around the hole.
- (e) Place patch over hole and press firmly and smoothly into place.

- (f) Glass test tube may be inserted into finger of glove to make it easier to apply patch.
- (g) Gloves should be mended in pairs so that in mating gloves for use the patches will always be on the inside of the glove.
- (g) Finger tips should not be mended as the patch interferes with the sense of touch.

(3) Preparing gloves for autoclaving:

- (a) Only tested and mended gloves are used. Mended gloves are usually kept separate from those which require no mending as surgeons are not given mended gloves for major surgery except in times of extreme shortage of gloves.
- (b) Powder gloves on both sides with glove powder. This may best be done by using a large basin with powder in it. Make certain no powder is left in finger tips.
- (c) Mate gloves as to size. Be sure there is one glove for each hand, right side out.
- (d) Turn back cuff of each glove over the outside for approximately three or four inches.
- (e) Place gloves in glove case with thumb of glove uppermost and toward the center of the case. This is a check to be sure there is a right and left glove and a standard way of placing gloves in case makes it easier to observe good glove technique in putting them on.
- (f) Fold and tie glove case.

(4) Care of gloves after use:

- (a) If used on a septic case they should first be soaked in antiseptic solution (20% cresol for 20 minutes)
- (b) Wash thoroughly inside and out in soap and water.
- (c) Rinse thoroughly under running water.
- (d) Dry thoroughly before testing and mending.

(5) Care of new gloves:

- (a) Wash thoroughly, rinse well, dry
- (b) Test and mend before preparing for autoclaving.

b. Rubber drains are used in wounds to facilitate removal of drainage material from the wound and to keep the edges of the wound from sealing over.

- (1) Rubber tube drains may be short lengths of plain rubber tubing or the tubing may be perforated.

(2) Rubber dam or rubber tissue may be cut to any desired size, used alone or in combination with gauze. Rubber dam may be used in small strips. Penrose drains are rubber tissue tube drains. A folded gauze wick may be inserted through the Penrose tubing thereby making a cigarette drain (The gauze should extend beyond both ends of the tubing)

(3) Preparation for autoclaving:

- (a) Wash thoroughly in soap and water. Rinse under running water and dry. (Demonstrate with rubber tubing, rubber dam, Penrose tubing).
- (b) Cut to desired size. Place gauze wicks in Penrose drains if so desired.
- (c) Wrap in 4 x 8 gauze square and brown paper or muslin wrapper or place in container with cover.

c. Catheters

(1) Soft rubber catheter

(a) Preparation for sterilization

1. Wash thoroughly in soap and water and rinse thoroughly under running water.
2. Sterilization by boiling
  - a. Boil in plain water for five minutes.
  - b. Remove from sterilizer with sterile forceps and place in sterile towel or sterile basin.

3. Sterilization by autoclaving

- a. Wrap clean dry catheter in gauze. Do not bend catheter. Sterilize full length or coiled. Wrap in outside wrapper or muslin.
- b. Catheter wrapped in gauze may be placed in container with cover for autoclaving.

(b) Storage: Soft rubber catheters should always be clean and dry for storage. They should be placed full length on a flat surface or in a covered container.

(2) Hard rubber catheters

(a) Care:

1. Wash thoroughly after use in soap and water, rinse well and dry.

2. Store in a dry place, full length on a flat surface or in a covered container.

a. Sterilization

1. Cannot be boiled or autoclaved.
2. Chemical sterilization by soaking in disinfectant solution (5% Carabolic Acid or 1:5000 Bichloride or Mercury) for not less than two hours.
3. Following chemical sterilization catheters must be thoroughly rinsed with sterile water before use.

4. Application:

a. Have students patch, powder, and package rubber gloves for autoclaving.

Training Notes:

1. Stress general rules for care and sterilization of rubber goods.
2. Emphasize procedure for patching and matching rubber gloves.

Tenth Period - Two Hours

Topographical Anatomy: Local Preoperative Preparation

Place: Classroom

References: "Surgical Nursing," Eliason, Ferguson, Farrand, pp 68-86

Instructional Aids:

Personnel: One man to direct conference; two men to act as demonstrators; one man per eight students to supervise application

Equipment: 2 skin pencils  
Non-standard charts  
1 patient unit, complete  
1 prep tray containing:

1 jar sterile gauze 2x2's	1 jar sterile cotton
1 pkg of new razor blades	applicators
1 pair forceps	1 emesis basin
1 bottle 70% alcohol	1 bottle Tr. green
1 basin of warm water	soap

1 razor	1 roll adhesive tape
1 pr bandage scissors	1 pkg with 1 sterile towel
1 small enamel bowl	1 can ether
1 bottle Tr. Merthiolate	2" gauze bandage

Individual Equipment: Notebook and pencil

18th and 19th Hours - Conference, Demonstration

Points to be Covered

1. Introduction:

a. Topographical anatomy:

- (1) Definition: The description and mapping out of an anatomic region or special part of the body.
- (2) Relation of topographical anatomy to preoperative preparation. Knowledge of the part is essential to decide the area to be prepared.
- (3) Operative field to be prepared for some of the more common operations:
  - (a) Abdominal section: From sternum to and including suprapubic area, with particular attention to umbilicus (naval) and creases of groins. Abdominal sections include operations for appendicitis, gallbladder, and operations on the stomach and intestines and other abdominal organs.
  - (b) Hernia: From umbilicus downward, including especially the suprapubic area, and about six inches of upper thigh.
  - (c) Rectal operations: Perineum and buttocks for an area about ten inches square, with particular attention to the region around the anus.
  - (d) Breast amputation: From clavicle to below ribs, including axilla on affected side, and to nipple line to opposite side.
  - (e) Amputations of appendages: To about six inches above expected site of amputation on affected extremity.
  - (f) Skin grafts: Prepare area from which graft is to be taken.
  - (g) Cranial operations: Follow specific instructions from surgeon as to the area to be prepared.

b. Objective in local preparation for surgery: To assist in the elimination of source of infection from the skin.

## 2. Demonstration:

- a. Demonstrate local preoperative preparation for an abdominal section.
- b. Demonstrate local preoperative preparation for operation on the leg.
- c. Demonstrate area to be prepared for various operations by use of non-standard charts and use of skin pencil on living subject.

## 3. Procedure:

## a. Preparation:

- (1) Assemble equipment at bedside.
- (2) Prepare patient for procedure
  - (a) Explain what is to be done.
  - (b) Expose part to be prepared.

## b. Steps for local preparation for general surgery:

- (1) Cleanse area with green soap solution paying particular attention to indentations (such as umbilicus) and creases. Use 2 x 2's and cotton applicators.
- (2) Lather area and shave. Be sure to remove all hairs and take care not to cut or scratch the skin.
- (3) Wash area with warm water and dry.  
(Following steps vary with instructions from surgeon or routine of hospital)
- (4) Sponge area with 70% alcohol and dry.
- (5) Sponge area with ether to completely dry skin.
- (6) Paint area with Tr. Merthiolate.
- (7) Cover area with sterile towel. Hold towel in place either with adhesive strips or many tailed binder.

c. Steps for local preparation for orthopedic surgery: Depending on the extent of surgery the preparation may begin 24 or 48 hours before operation. This is required because bone is highly susceptible to infection and greatest care is essential to eliminate sources of infection.

- (1) For 24 hour prep (to be done 24 hours before operation)
  - (a) Shave part well above and below expected site of operation.
  - (b) Clean area with green soap and water.
  - (c) Sponge area with alcohol.
  - (d) Sponge area with ether.

- (e) Paint area with Tr. Merthiolate.
- (f) Cover with sterile towel. Hold towel in place with adhesive strips and/or bandage.

(2) For 48 hour prep (to start 48 hours before operation)

- (a) Perform all steps of 24 hour prep 48 hours before operation.
- (b) Repeat all of above steps 24 hours before operation.

#### Training Notes:

1. Stress careful shaving of area. Hair must all be removed. Avoid cuts and scratches.

2. Emphasize careful cleansing of indentations and creases.

#### Eleventh Period - Two Hours Dressings, Sponges and Linen Supplies

Place: Classroom

References: "Surgical Nursing," Eliason, Ferguson, Farrand, 6th Ed, pp 582-585.

#### Instructional Aids:

Personnel: One man to direct conference; one man to act as demonstrator; one man to supervise each twelve (12) students in application.

<u>Equipment:</u>	One work table	1 Laparotomy sheet
	Wooden pattern for making 2x2 and 4x4 gauze squares	10 towels
	Gauze squares cut 16x16, 8x16, 4x8	2 gowns
	Applicator sticks	1 diackcontrol
	Absorbent cotton	1 large wrapper
	4 Shoots	2 medium wrappers
		1 small enamel basin

#### Individual Equipment:

<u>Each student:</u>	Notebook and pencil	6 applicator sticks
	Wooden pattern for making 2x2 and 4x4 gauze squares	Absorbent cotton
	Gauze squares cut: 8x16 and 7x8	Wrappers for gown, towel, sheet and gauze squares
	Operating room gown	1 modicino glass or small enamel cup
	1 hand towel	
	1 sheet	

Each six students: Work table

20th and 21st Hours - Conference, Demonstration, ApplicationPoints to be Covered

## 1. Introduction:

a. Dressings, sponges, and linen supplies are used constantly in the operating room and on the wards. Many of these supplies are standard in size and are folded in a standard way for sterilization and use. This standardization makes the handling and use of the supplies much more convenient. It is also an aid in the practice of aseptic technique.

## 2. General rules:

a. In making gauze sponges the essential feature is cut edges turned in so that there may be no ravelings. A thread left in a wound interferes with the healing of the wound.

b. In folding linen for sterilization it is important that each item be folded so that it can easily be unfolded without contamination.

## c. In wrapping gauze and linen supplies:

- (1) The wrapper should be the correct size so that the item is completely covered. It should either be of a thick material or double thickness of muslin. There should be no holes in the wrapper. Thick brown paper may be used for dressing wrappers.
- (2) Pins should be inserted so that they remain firmly in place. The point should not protrude; only the head of the pin should be visible.
- (3) All packages should be legibly marked on the outside covering as to the contents and date of sterilization.
- (4) Freshly sterilized supplies should be placed on the bottom of the pile or in the rear of the cupboard to avoid accumulation of stale supplies.
- (5) Sterile supplies kept longer than two weeks should be resterilized before use.
- (6) Packets of gauze or linen supplies should always contain the same number. Sponges used in the OR should be counted by two (2) persons when wrapping and again by two (2) persons before use to avoid errors in the sponge count.

## 3. Gauze Sponges

- a. Size and type varies according to use:

- (1) 4 x 8 sponges; 4 x 4 sponges; 2 x 2 sponges
- (2) Tape sponges used in OR.

b. Uses:

- (1) To cover and protect wounds.
- (2) To clean wounds.
- (3) To apply medication.
- (4) To absorb drainage from wounds.

4. Applicators are made by firmly and smoothly winding a small amount of cotton on the end of an applicator stick. This may easily and quickly be done by dipping the end of the stick in water, picking up a small amount of cotton and twirling it between the fingers to wind the cotton around the stick. Applicators have many uses:

- a. To apply medication.
- b. To clean a wound.
- c. To obtain a specimen of discharge for culture or smear.
- d. To remove foreign bodies from the eye.
- e. To remove wax from the ears.
- f. Others

5. Linen supplies may be wrapped individually or in a combined package containing all the different articles of linen to be used for a specific operation. Such a combined package is the Laparotomy Pack which contains different articles of linen needed in an abdominal operation.

6. Diack controls are small glass tubes which contain a substance which changes color with adequate sterilization. These are placed inside packages to insure complete sterilization. If the substance in the tube changes in color from cream to red the package is sterile.

7. Demonstrations:

- a. Demonstrate making 2 x 2 and 4 x 4 gauze sponges using marked boards.
- b. Demonstrate wrapping packages of sponges.
- c. Demonstrate making cotton applicators.
- d. Demonstrate folding and wrapping linen and gauze supplies for a laparotomy pack.

8. Application:

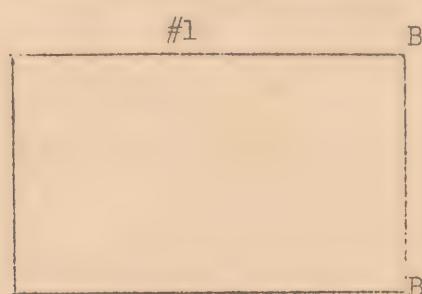
- a. Students make 2 x 2 and 4 x 4 gauze sponges under supervision.

- b. Students make cotton applicators.
- c. Students fold sheet, gown and towel and wrap for autoclaving.

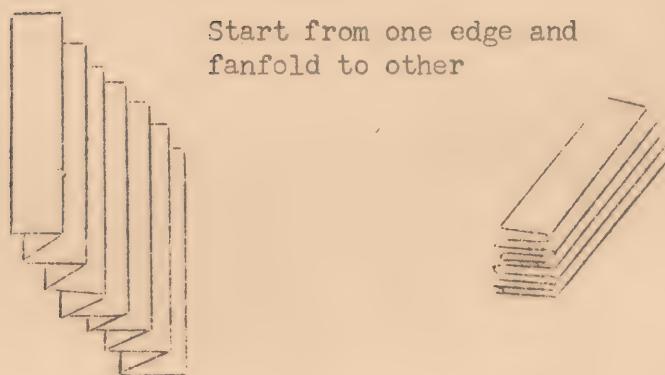
Training Notes:

1. Stress general rules in preparing gauze and linen supplies for sterilization.
2. Emphasize importance of standardization in making gauze and linen supplies and wrapping them for sterilization.

Diagram for folding Towel



#2



#3

Fold in half

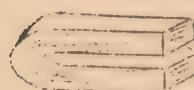
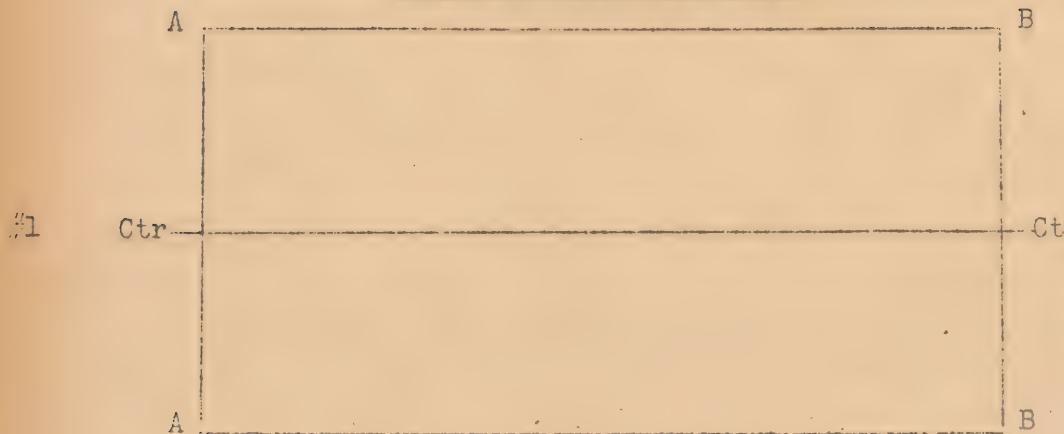


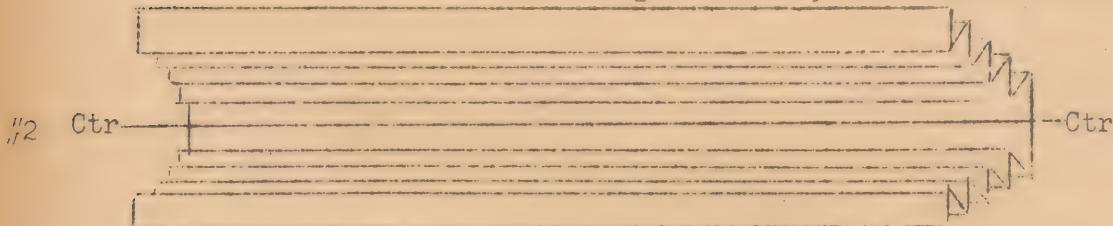
Diagram for folding Sheet



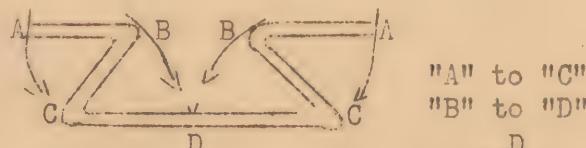
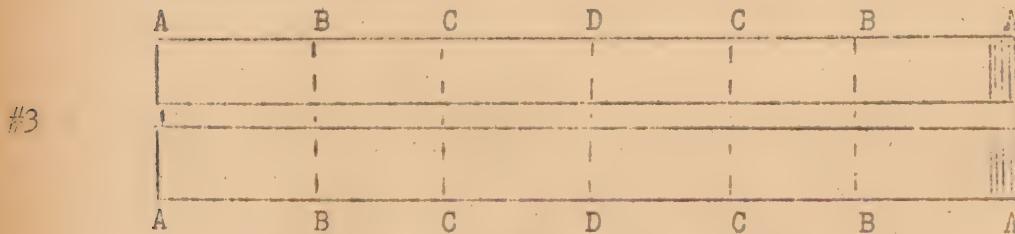
Fold "A" to "B" to form half sheet

Folded half sheet:

1. Begin at right and fan fold to center
2. Begin at left, fan fold to center



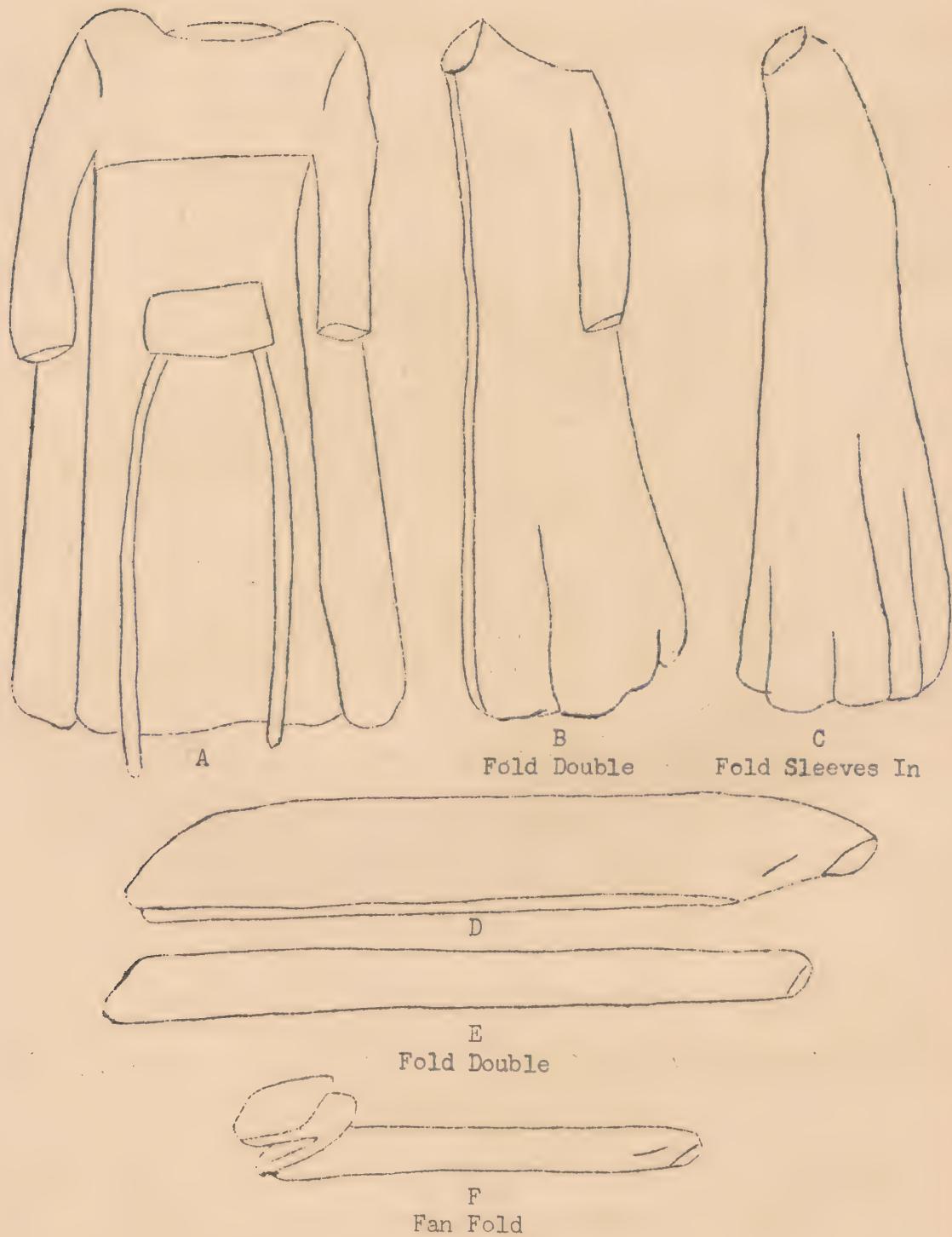
Fan folded sheet



#5



Fold in half at "D"

Diagram for folding OR Gown

Twelfth Period - One Hour  
Ligatures, Sutures, Needles

Place: Classroom

References: "Surgical Nursing," Eliason, Ferguson, Farrand, 6th Ed.,  
pp 595-600

Instructional Aids:

Personnel: One man to direct conference; one man to act as demonstrator.

Equipment:

- 2 suture jars
- 6 ea Suture, catgut, chromic, sizes 0, 1, 2
- 6 ea Suture, catgut, plain, sizes 0, 1, 2
- 6 ea Suture, catgut, chromic, size 00, with 1 3/4 inch straight nontraumatic needle affixed
- 6 ea Suture, catgut, chromic, size 00, with 1 1/8 inch half circle non-traumatic needle affixed
- 1 spool, suture, silk, braided, not-capillary, size 4-0
- 1 spool, suture, nylon, braided, non-capillary, size 5-0
- 1 pkg, suture, silk, dermal, medium
- 1 coil, suture, silkworm gut, medium
- 1 needle holder
- 1 pkg needle, catgut, Mayo, taper point
- 1 pkg needle, catgut, Mayo, Trocar point
- 1 pkg, needle, skin suture, 3/8 circle, cutting edge.
- 1 pkg, needle, abdominal, straight, Keith, triangular point
- 2 ea, scissors, suture
- 2 ea, forceps, hemostatic
- 2 ea, forceps, sponge
- 1 jar, gauze sponge, 4 x 4
- 1 ea, basin, operating room
- 1 ea, basin, pus
- Army sterilizing solution
- Alcohol 70%
- 2 ea, petri dishes

Individual Equipment: Notebook and pencil

22d Hour - Conference, Demonstration

Points to be Covored

1. Introduction and explanation

a. Ligatures and sutures

(1) Definitions:

- (a) Ligature is a free piece of suture material not threaded on a needle for the purpose of tying blood vessels that have previously been clamped with a hemostatic forcep.
- (b) Suture is threaded on a needle and is used for sewing or suturing together the edges and surfaces of tissue, for checking the flow of blood, fastening drainage tubes in position, etc.

(2) Types of ligatures and sutures:

- (a) Absorbable sutures which are absorbed by the body tissues.
  - 1. Used in almost every wound.
  - 2. Length of time before absorption takes place varies.
  - 3. Does not have to be removed.
  - 4. Catgut is the most commonly used absorbable suture. The sizes are graded according to their caliber from 000, the finest, up to 6 or 8, very coarse.
    - a. Plain catgut lasts in the wound 6 to 10 days.
    - b. Chromic catgut lasts in the wound 20 to 30 days.
- (b) Nonabsorbable sutures are used when the stitch is to be removed later or where strength is needed for a long period of time.
  - 1. Used for skin closure, deep tension sutures, bone work, etc.
  - 2. Must be removed when no longer needed in the wound.
  - 3. Varieties in common use.
    - a. Silk or nylon thread used chiefly for stitching the skin.
    - b. Silkworm gut used for tension sutures, especially in closure of abdominal wounds or those in which there is particular strain. It may also be used for skin sutures. Size varies: fine, medium, heavy.

(3) Sterilization of sutures

- (a) Catgut

1. Prepared and sterilized catgut comes in hermetically sealed glass tubes. Outside of tube must be sterilized before use to avoid contamination of sterile catgut within.
2. If marked "boilable" the tube may be sterilized by boiling or by chemical sterilization. Routine for sterilizing jars of catgut in the operating room (repeated every 7 days or oftener if supply is exhausted or jar is contaminated) follows:
  - a. Wash suture jar and lid with soap and water. Rinse well and boil for 5 minutes or dry and autoclave.
  - b. Place tubes of catgut on end in jar separated according to size. Separate jars are usually used for plain and chromic catgut.
  - c. Cover tubes of catgut completely with alcohol 70% and cover jar.
  - d. Mark jar "unsterile" and wait 8 hours before putting with sterile supplies ready for use.
  - e. For re-sterilization the same procedure is followed. Alcohol may be filtered and used again.
  - f. To remove sterile tubes from the jar use a sterile sponge forcep. Keep lid of jar in place at all times except when removing sutures from jar.
  - g. Non-absorbable sutures may be sterilized by boiling in plain water for 10 minutes or by autoclaving.

b. Needles:

- (1) Type and size vary according to use.
- (2) They may be straight, full curved or half curved.
- (3) Types of points:
  - (a) Taper point, used for operations on intestines, brain, mucous membrane, and such delicate tissue.
  - (b) Trocar point, used for skin or any dense tissue.
  - (c) Cutting edge, used for skin or any dense tissue.
  - (d) Triangular point, used for skin or any dense tissue.
- (4) Size and caliber vary. Usually the smallest number indicates the largest needle, although sometimes just the reverse is true.
- (5) Eye of needle varies in size and shape.
- (6) Atraumatic needles are manufactured with the sutures attached. The suture and needle are of the same size.

and by virtue of the way it is made very little damage to tissue is caused, hence the name "atraumatic" (without trauma or injury).

(7) Sterilization of needles.

- (a) Repeated or prolonged boiling dulls the points.
- (b) Chemical sterilization (repeated every 24 hours or oftener if supply is exhausted or dish is contaminated)

1. Wash petri dish thoroughly and boil for 3 minutes.
2. Check each needle for burrs before placing them in the petri dish. Burrs should be removed by use of Carborundum stone if present.
3. Cover needles completely with army sterilizing solution and cover petri dish.
4. Mark "unsterile" for two hours before placing with sterile supplies for use.
5. To remove sterile needles from the Petri dish use a sterile hemostatic forcep or similar instrument. Keep lid of dish in place at all times except when removing needles.

2. Demonstration

- a. Demonstrate features of different types of sutures, ligatures and needles as discussed.
- b. Demonstrate sterilization of catgut.
- c. Demonstrate sterilization of needles.
- d. Demonstrate removing sterile tube of catgut from jar and breaking tube in 4 x 4 gauze sponge.

Training Notes:

1. Emphasize difference in type of suture material according to use.
2. Stress methods of sterilization of suture materials and needles.
3. Emphasize points of variation in needles.

Thirteenth Period - One Hour  
Spinal Puncture

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, Ch 29.

Instructional Aids:

Personnel: One man to direct conference and demonstration; one man to assist with demonstration; one man to act as patient.

Equipment:

1 Examining table with pad	1 bottle merthiolate
2 sheets	1 pr rubber gloves
1 bowl, enamel, small	4 sterile towels
1 pr pajamas	1 bottle local anesthetic
1 roll adhesive 2"	
1 spinal puncture set containing:	
2 cc syringe	2 medicine glasses
2 needles gage #25, 1½ inch canula	2 lumbar puncture needles
1 hemostat, 6½" straight	3 test tubes
	6 4x4 gauze sponges

Individual Equipment: Notebook and pencil

23rd Hour - Conference and Demonstration

Points to be Covered

1. Introduction

a. A lumbar puncture is the introduction of a hollow needle into the subarachnoid space of the spinal canal in the lumbar region. This is a procedure commonly done on the ward and in the operating room. While the procedure will be carried out by a doctor it may be the duty of the technician to assist him.

2. Explanation and Demonstration

a. Purposes

- (1) Withdraw cerebrospinal fluid to relieve pressure.
- (2) Secure a specimen of fluid for diagnostic purposes.
- (3) Inject medicine in the treatment of the disease.
- (4) Inject spinal anesthesia.
- (5) To introduce air or an opaque liquid before taking an x-ray for diagnosis of cord lesions.

b. Use of Equipment:

- (1) Spinal puncture set - obtained sterile from Central Service.
  - (a) 2cc syringe and 25 gage needles for local anesthetic.

- (b) Hemostat to hold sponge to prep area.
- (c) 2 medicine glasses for merthiolate and anesthetic.
- (d) Lumbar puncture needles.
- (e) Test tubes for specimens.
- (f) 4 x 4's to clean area and for dressing.

(2) Sterile towels

- (a) Obtained from Central Service
- (b) For doctor to dry hands after scrubbing and to drape area.

- (3) Local anesthetic - usually procaine 1% obtained from Central Service.
- (4) Rubber gloves - obtained sterile from Central Service
- (5) Tr. of merthiolate - to prep area.
- (6) Spinal manometer - if ordered by doctor may be obtained sterile from Central Service. It is used to test the pressure of the fluid.
- (7) Adhesive - 2 strips  $\frac{1}{2}$ " by 4" - used to hold dressing in place.

c. Preparation of the patient:

- (1) Explanation of treatment, type of procedure and purpose, usually done by the doctor.
- (2) Position - as ordered by doctor. Usual position is for the patient to lie on his side even with the edge of the bed, back arched, knees bent and shoulders brought forward, chin on chest. The treatment is usually done on an examining table since it is firmer than the bed.

d. Procedure

(1) Preparation:

- (a) Assemble the equipment at the bedside or treatment room.
- (b) Assist patient on examining table or into position in bed.
- (c) Drape patient with sheet so that lumbar region of back is exposed.

- (2) Steps - assist doctor as needed. Doctor usually scrubs hands, prepares area, puts on sterile gloves, drapes area, administers the local anesthetic and inserts the needle. If he wishes to test for pressure he will do this with the spinal manometer before he withdraws fluid. After needle is withdrawn, cover

area with small flat sponge. During procedure technician should stand on side of table or bed opposite doctor to maintain position of patient.

(3) Follow-up

- (a) Return the patient to bed by litter if procedure was done in treatment room. Keep patient flat in bed if ordered by the doctor.
- (b) Take specimen to laboratory.
- (c) Remake examining table.
- (d) Wash all equipment with cold water, soap and warm water. Return equipment with wrappers to Central Service. Put the equipment in proper place on ward.
- (e) Notify nurse as to time of treatment, whether or not specimen was obtained and taken to laboratory.

Training Notes:

1. Emphasize that the technician should assemble all equipment and have patient ready for treatment before doctor arrives.
2. Stress that it is the technicians responsibility to care for the equipment after use.
3. Emphasize that the patient may require care following treatment.

Fourteenth Period - Two Hours  
Dressing carriage and Sterile Tray

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, Ch 38.

Instructional Aids:

Personnel: One man to direct conference and demonstration; one man to assist with demonstration; one man to act as patient.

Equipment:

1 dressing carriage	1 probe
2 16 oz jars	1 grooved director
1 glass jar about 7" high	2 1000" bottles or flasks
2 enamel pans (shallow, rectangular)	18 applicators
1 enamel bucket	200 4x4 gauze squares
1 dozen paper bags	6 each of gauze bandage 1 to 4"
1 sponge stick	1 qt alcohol 70%
1 forceps, dressing 10"	1 qt Tr. merthiolate
2 forceps, dressing 5 $\frac{1}{2}$ " straight	2 asepto syringes
	12 tongue blades

4 large enamel cans with covers	3 hemostat, curved $6\frac{1}{4}$ "
3 4 to 8 oz bottles for solución, 2 clear glass, 1 brown glass	1 pt sterilizing solution
1 enamel basin	18 hand towels
1 instrument sterilizer	3 ace bandages - 2"
1 pr bandage scissors	60 2x2 gauze squares
2 pr suture scissors	12 ABD pads
3 hemostat, straight, $6\frac{1}{4}$ "	3 medicine glasses
	4 each of muslin bandage 2 and 3"
	2 rolls 3" adhesive
	2 rolls 1" adhesive

Individual Equipment: Notebook and pencil; one non-standard diagram of dressing cart per student

#### 24th and 25th Hours - Conference and Demonstration

##### Points to be Covered

###### 1. Introduction

a. The Dressing Cart - for convenience and efficiency articles customarily used for surgical dressings are kept on a cart which can be wheeled from one patient to another.

###### 2. Explanation

###### a. Dressing Cart

###### (1) General arrangement of equipment (see diagram)

- (a) Top shelf - most sterile dressings and instruments, small bottles of antiseptic solutions, local medications and ointments as used by ward.
- (b) 2d shelf - Unsterile dressings and towels. Extra equipment; bottles of irrigating solutions.

###### (2) Care of cart:

###### (a) Sterile supplies

- 1. Sterile enamel cans - considered sterile for 1 week from date sterilized. Date on can is date of sterilization.
- 2. Sponge sticks and holder--sterilized every 24 hours by autoclaving. Army sterilizing solution (phenol, alcohol and glycerine in water) used in holder.

3. Sterile instruments and basin

- a. Instruments sterilized by boiling after use.
- b. Basin, towel and instruments autoclaved once every 24 hours.

(b) Daily cleaning

- 1. All equipment removed once a day. Cart dusted with damp cloth.
- 2. All cans and bottles dusted before replacing on cart.
- 3. Replace all outdated supplies with sterile equipment.
- 4. Solution bottles
  - a. Refill all empty or partially empty bottles
  - b. Replace soiled labels
- 5. Replace empty adhesive rolls.
- 6. Restock extra supplies on bottom shelf.

(c) Rules to observe in using the cart:

- 1. Keep sterile cans and jars closed when not using them.
- 2. In removing the cover from a sterile can, lift it and move it aside, but do not invert it. Remove the contents of the can with a sterile sponge stick and immediately replace the cover.
- 3. Do not touch the rim of a sterile container with either sterile or non-sterile articles.
- 4. Do not reach over open cans containing sterile supplies.
- 5. The outside of a dressing applied to a wound becomes non-sterile and must not be touched with a sterile instrument.
- 6. The handle of the sponge stick is not sterile. The rest of the sponge stick is sterile. Always keep the tip of the wet sponge stick lower than the handle.
- 7. Do not allow the sterile sponge stick to come in contact with the wound or with instruments or dressings which have touched the wound.
- 8. If a break in technique is made and duplicate sterile supplies are not available, discontinue dressing until they can be obtained.

b. Sterile tray - If dressing cart is not available or special sterile equipment is needed a sterile set-up may be arranged on trays.

## 3. Demonstration:

a. Demonstrate the daily care of cart - Stress proper handling of sterile equipment.

b. Demonstrate use of cart according to following procedure. (Use student dressed in pajamas as patient.)

c. Demonstrate the set-up of a sterile tray according to the following procedure.

## 4. Procedure:

## a. Use of dressing cart:

## (1) Preparation

- (a) Take cart to bedside - place at foot of bed
- (b) Expose dressing to be changed

## (2) Steps

- (a) Place container for soiled dressings on floor within doctor's reach.
- (b) Place container for soiled instruments on foot of bed.
- (c) Hand doctor unsterile equipment as needed. Use sterile sponge stick to pass sterile equipment to doctor.
- (d) Wash hands between dressings.

## (3) Follow up:

- (a) When dressing is finished replace bed covers and make patient comfortable.
- (b) Remove equipment from bedside.
- (c) Empty soiled dressings into large container in utility room. Wash container and return to dressing cart.
- (d) Wash instruments with cold water, soap and warm water and boil 10 minutes. Return to dressing cart.
- (e) Scrub container for soiled instruments - Dry and return to dressing cart.
- (f) Replace gauze, towels or other supplies used in doing dressings.

## b. Set up of sterile trays:

## (1) Preparation - Assemble the equipment.

- (a) Tray
- (b) 3 sterile towels
- (c) Sterile equipment to be used on tray
- (d) Sterile sponge stick or forceps.

(2) Steps:

- (a) Cover bottom of tray with two sterile towels
- (b) Using sterile sponge stick - arrange sterile equipment on tray.
- (c) Cover tray with sterile towel..

Training Notes:

1. Emphasize rules in using the cart.
2. Emphasize cleaning equipment and restacking cart after use.

Fifteenth Period - Two Hours  
Wounds and Their Care

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson,  
Ch 38.

Instructional Aids:

Personnel: One man for every four students to supervise applicatory work.

Equipment: None

Individual Equipment: 1 completely set-up dressing cart per every four students  
(See GTHP period #14 for equipment)  
1 pr pajamas per student  
2 patient units with beds made per four students

26th and 27th Hours - Applicatory

Points to be Covered

1. Introduction:

a. Technician on ward is frequently called upon to assist doctor in changing dressings, or in changing them himself.

b. Technician should never change dressings or use the dressing cart without the permission of the doctor or nurse.

## 2. Application:

a. Students divided into groups of four with one instructor to each group.

- (1) 2 students, dressed in pajamas act as patients.
- (2) 2 students act as technician to change dressings.

b. Cadre simulate wounds by use of colored solution and apply dressings on students acting as patients.

c. Students change dressings under supervision of cadre.

d. Clean up and sterilize equipment and restack dressing cart.

e. Repeat steps a, b, c and d - students acting as patients become technicians; technicians, patients.

Training Notes:

1. Supervise closely. Correct mistakes in technique as they are made.

2. Emphasize that technician should never change a dressing or use the cart unless instructed to do so.

3. Stress that cart should always be cleaned and restacked after use.

Sixteenth Period - One Hour  
Use of Plaster Cast

Place: Classroom

References: None

Instructional Aids:

Personnel: One projectionist

Equipment: Projector and screen; TF 8-2080

Individual Equipment: Notebook and pencil

28th Hour - FilmSYNOPSIS OF TRAINING FILM 8-2080

The importance, duties, and abilities of the plaster technician are emphasized as this film opens with a battle casualty in transport

to a hospital, and then shows a team of surgeon and technician at work in the operating room applying a cast. Next, details of the plaster room are brought out; organization, instruments, and materials. The making, storing, and conservation of plaster bandages and splints are demonstrated. Simple and then more complex casts are demonstrated to show the technician an ideal plaster room, and how principles, once fully understood may be used to improvise one anywhere. Emphasis throughout the film is on smooth team work. Cast removal and special cast set-ups are shown, along with other technical details. At the close of the film, the need for trained plaster technicians is reiterated.

Seventeenth Period - Four Hours  
Plaster Cast

Place: Classroom

References: FM 8-50 pp 40-41; "Surgical Nursing," Eliason, Forguson, Farrand, 6th Edition, pp 450-455

Instructional Aids:

Personnel: One man to direct conference; one demonstration team to each platoon; one man for each twelve students to supervise application.

Equipment: Crinoline 8 inches x 18 feet  
Plaster of paris powder, 5 pound can  
Table  
Tongue depressors, 6  
Newspaper or paper napkins  
6 commercial type prepared plaster bandage  
2 1/4 quart enamel buckets 2/3 full of warm water.  
(2d bucket for discarded paper wrappers)  
1 pair plaster shears  
1 plaster knife  
1 pencil  
1 pr shears for cutting felt  
Cotton felt  
Sheet wadding  
Stockinette, 3 inch and 4 inch

Individual Equipment: Notebook and pencil; one set of equipment as listed for demonstration per four students.

29th, 30th, 31st, and 32d Hours - Conference, Demonstration, Application

Points to be Covered

1. Introduction and Explanation:

a. Plaster of paris is perhaps the most valuable of the mater-

ials used for fracture dressings. It is usually employed in the form of bandages of crinoline into the meshes of which plaster of paris has been rubbed. When the bandage has been wet, it becomes soft for a time, but soon sets as it dries, and hardens, taking the shape to which it has been molded before setting. This molded and dried plaster of paris bandage on a part of the body is called a plaster cast.

b. Uses of plaster cast:

- (1) To maintain position in treatment of a fracture.
- (2) To enforce rest in the treatment of injuries and diseases of joints.

2. Plaster of paris bandages

a. Prepared plaster bandages of commercial type may be used.

b. Preparation of plaster bandages:

- (1) Crinoline is torn in the desired width and loose threads are pulled from each side.
- (2) Roll crinoline strip loosely on a tongue depressor or similar piece of wood.
- (3) Unroll about 3 feet of crinoline on flat surface; work plaster of paris gently into mesh with palm of hand, spatula, tongue depressor, etc., and roll loosely on another stick. Repeat the process with next three (3) feet of bandage and continue until entire bandage is impregnated with plaster. Remove stick and wrap in paper. Store in a dry place, lying flat.

3. Application of plaster cast:

a. This is done by the doctor but the technician may be required to hold the part in the desired position or assist with the actual application. For these reasons he should be familiar with the method of applying a plaster cast.

b. Preparation for applying a cast:

(1) Assemble equipment

- (a) 14 qt bucket, 2/3 full of warm water. Addition of 3 or 4 teaspoonfuls of salt to the water will hasten the subsequent hardening of the cast.
- (b) Sufficient prepared plaster of paris bandages, the number and width depending on the type of cast and the desires of the doctor.

- (c) Stockinette in sufficient quantity and of the correct width to cover the part.
- (d) Cotton felt
- (e) Sheet wadding
- (f) Shears

(2) Prepare patient: Wash the part to which cast is to be applied with soap and warm water. Dry thoroughly.

c. Steps in applying plaster cast:

- (1) Cover the part with stockinette or sheet wadding or both. This covering must be applied smoothly leaving no creases.
- (2) Protect bony prominences with felt and extra sheet wadding.
- (3) Place two or three plaster bandages in the bucket of warm water. When bubbles cease to rise the bandage has been wet through.
- (4) Remove one bandage from the water by grasping bandage at both ends to prevent loss of plaster. Excess water is removed by twisting the roll slightly.
- (5) Free the end of the bandage and hand it to the doctor.
- (6) Replace bandages removed from the bucket of water with another bandage.
- (7) Bandages are applied rapidly and evenly to the part. Additional bandages are applied as soon as the first has been completed.
- (8) During application the bandage should be gently smoothed with the hands to provide an even surface.
- (9) Longitudinal reinforcement in the form of plaster splints may be incorporated in the cast while it is being applied. These splints are made by folding several layers of wet plaster bandage back and forth to the desired thickness and length. They are used in parts of the cast which may call for greater strength.
- (10) When the final roll has been applied the surface of the completed cast may be rubbed evenly with liquid plaster prepared by addition of water to dry plaster.

3. Immediate aftercare of plaster cast:

a. Do not move the patient until the cast has set. Movement of the part may cause a crack or wrinkles in the cast. The cast usually sets in 7 to 10 minutes.

b. In moving patient back to his bed protect the cast. It is not dry and will crack easily.

c. Drying of cast may be hastened by exposure to air, heat lamps, heated cradles, etc.

d. After cast is dry it may be trimmed around the edges and bi-valved (split along both sides). This cutting of the cast is accomplished by use of plaster shears and plaster knife. The doctor usually marks the cast where he wants it trimmed and cut.

4. Demonstration

- a. Demonstrate preparation of plaster bandages.
- b. Demonstrate application of an arm cast.
- c. Demonstrate trimming and bivalving the cast.

5. Application:

- a. Students prepare plaster bandages.
- b. Working in teams of 4, students apply arm cast.
  - (1) One student acts as patient.
  - (2) One student holds arm in position.
  - (3) One student soaks and removes plaster bandages from water.
  - (4) One student applies plaster cast.
- c. Student who held arm in position in application of cast trims and bivalves cast.

Training Notes:

1. Stress spreading plaster evenly in preparation of plaster bandages.
2. Stress points in which the technician aids the doctor in applying a cast.

Eighteenth Period - Two Hours  
Operating Room Personnel and Their Duties

Place: Classroom

References: "Surgical Nursing," Eliason, Ferguson, Farrand, 6th Ed, pp 563-607

Instructional Aids:

Personnel: One man to direct conference.  
 Four men as demonstrators: One circulating Technician; One scrub Technician; One Surgeon; One Anesthetist.

Equipment: Complete OR proper; Basic set instruments; Blackboard and chalk; Sterile supplies for operation; Wheeled litter; Manikin -- Chase doll for patient.

Individual Equipment: Notebook and pencil; Mimeographed sheet of duties for a circulator and scrub Technician.

### 33d and 34th Hours - Conference and Demonstration

#### Points to be Covered

##### 1. Introduction:

a. The purpose of this period is to show the duties of the various personnel who work in an operating room. This can best be accomplished by a running commentary on the various duties during demonstration of a mock operation. Each person present during an operation has specific duties to perform and team work in performing those duties is essential to the smooth performance of the operation.

##### 2. Explanation:

a. The surgeon and anesthetist are professionally trained people. The anesthetist may be either a doctor or a nurse anesthetist. Since their duties do not concern the technician except in coordinating the work of the operating team as a whole their duties will not be emphasized but will be performed only to aid in showing the duties of the technicians.

b. The circulator (unsterile person in the OR) and the "Scrub" (sterile person who assists the surgeon) may be either nurse or technician. During an operation the efficiency of the operating room depends upon these two people.

##### c. OR Personnel and their duties and responsibilities:

###### (1) Chief of Surgical Service:

- (a) In general charge of all departments pertaining to surgery.
- (b) Makes final decision on all issues.
- (c) Accountable for the quality and outcome of all surgical professional work done in the hospital; it is his responsibility to assign only capable persons to do this work.
- (d) May be accountable for non-expendable property.

###### (2) Assistant Chief of Surgery:

- (a) Assists the chief in performance of his duties.
- (b) Assumes full responsibility in the absence of the chief.

## (3) Medical Corps Officers (Doctors)

- (a) Ward officers on Surgical wards.
- (b) Assist Chief or the assistant Chief in operations.
- (c) Perform operations.

## (4) Chief Anesthetist (Doctor)

## (a) Administrative responsibilities:

- 1. Accountable for non-expendable property.
- 2. Responsible for scheduling of cases and assigning rooms for operations.
- 3. Other duties as officer in charge of OR.

## (b) Professional responsibilities:

- 1. Decides type of anesthesia to be given.
- 2. Orders pre-anesthetic and post-anesthetic medications.
- 3. Gives anesthesia or assigns anesthetist.
- 4. Responsible for condition of patients during anesthetic.

## (5) Anesthetists (Doctors or Nurses)

- (a) Administer anesthesia as assigned by Chief Anesthetist.
- (b) Order pre-anesthetic and post-anesthetic medications as decided by Chief anesthetist.
- (c) Care of anesthetic equipment.

## (6) Chief Nurse or Supervisor of OR:

- (a) Responsible for administration of OR - works in coordination with Chief Anesthetist.
- (b) Supervises OR technique.
- (c) Supervises duty rosters of nurses, enlisted personnel and civilians in the OR.
- (d) Responsible for records.

## (7) Nurses -- duties as assigned by roster:

- (a) Scrub or circulate for operations
- (b) Prepare supplies
- (c) Sterilization of supplies
- (d) Care of instruments and equipment

## (8) NCO in charge:

- (a) Responsible to OR Supervisor
- (b) Scrub or circulate for operations
- (c) Check and order supplies
- (d) Linen exchange
- (e) Care of equipment -- check sterilizers, lights, OR tables, etc.
- (f) Makes duty roster for other enlisted personnel.
- (g) Supervises housekeeping.

(9) Technicians (WAC or EM): Duties as assigned by NCO in charge:

- (a) Scrub or circulate for operations
- (b) Housekeeping duties
- (c) Assist with supplies
- (d) Care of equipment.

(10) Civilians: Usually employed for specific duties.

3. Demonstration: Mock Operation. (One Hour)

- a. "Scrub technician" and "circulating technician" set up OR for appendectomy. (See attached sheet for specific duties of technician)
- b. "Anesthetist" assembles equipment for giving anesthesia.
- c. "Surgeon" prepares to operate.
- d. Patient (manikin) is moved from litter to table and prepared for operation, anesthetic administered.
- e. Steps in appendectomy proceed with each person performing his specific duties.
- f. On completion of operation cleanup of OR is demonstrated.

Training Notes:

1. Stress technicians' duties in the OR.
2. Emphasize importance of scrub technician and circulating technician in efficiency of OR during an operation.

DUTIES OF THE OPERATING ROOM PERSONNEL

## A. DUTIES OF THE CIRCULATOR: (Unsterile Technician)

1. Fill sterilizer with water.
2. Test lights, suction and cautery. Arrange OR equipment.
3. Collect necessary sterile supplies.
4. Open basic pack--open gloves on operating table.
5. Tie Scrub-Technician gown.
6. Fold discarded wrappers neatly and keep various sizes separated.
7. During draping of room, check continually on heat stand, cautery and other equipment. Prepare N. Saline solution. Help Anesthetist with infusion set-up. Place catgut tubes in suture basin with transfer forceps.
8. Open basin set--fill pitcher with warm sterile water.
9. Open remaining packages (drapes, sponges, applicators, etc.)
10. Check sterilizer for additional equipment. Check time.
11. And when assigned, run pack for autoclaving.
12. Fill basin with warm water.
13. Check and verify Lap. Sponge count ???
14. Transfer catgut-Needle to suture basin.
15. Bring instruments from sterilizer.
16. Pour Prep. Solution.
17. Prepare for entrance of patient.
18. Tie surgeon's and assistant surgeon's gown.
19. Assist in placing the patient on the table.
20. Arrange kick pails and stools near field (scrub tech.)
21. Help move Mayo Stand to operative field.
22. Arrange kick pails within use of surgeon and assistant.
23. Pour warm solutions--N.S. etc.
24. Connect suction. Set valve to proper pressure.
25. Keep room tidy. Give supplies needed to scrub technician.
26. Keep instruments off floor.
  - a. Wash discarded instruments.
  - b. Remove soiled linens as discarded.
  - c. Check Lap. Sponge count with Scrub Technician.
  - d. Watch for and remove perspiration from Surgeon and assistant.
  - e. Make out specimen card and send to lab.
27. Watch steps of operation--be alert for needed assistance.
28. Remove rings from sponges, when operation is almost finished.
29. Prepare adhesive for dressing. Blankets, Jackots, towel for head, etc.
30. Collect all soiled linens in hamper.
31. Aid in removing patient from table to litter and accompany to ward. Check equipment taken from OR: Rubber pillows, blankets, airways, etc.
32. Redress OR table etc. for next case. Lamp, mop floor, empty pails, remove soiled gloves, etc.

B. DUTIES OF THE SCRUB TECHNICIAN: (Sterile Technician)

1. Collect all instruments: rubber goods, needles, knife blades. (Select instruments by basic chart) Collect all solutions.
2. Place instruments in sterilizer and record time.
3. Place cutting instruments in solution and record time--for sterilization.
4. Scrub for operation.
5. Open inside pack. (towel and gown) Gown and glove, open pack.
6. Drape small table--place gowns and necessary towels.
7. Arrange additional linens--Drape all stands.
8. Place basins in proper positions.
9. Assemble gauze, 4 x 4 etc. in proper position.
10. Place instruments on table. Prep. Mayo Stand.
11. Arrange instruments in proper order.
12. Check number of tape sponges and place those needed in N.S. solution basin.
13. Always check number of sponges in additional packages opened.
14. Place suture material in proper place.
15. Place rubber gloves on gown table.
16. Check drapes and call for extras needed.
17. Prepare sponge forceps and assist in prep. of skin.
18. Assist in drape of patient.
19. Place and fasten suction tubing field. Place basin for discarded instruments.
20. Move Mayo Stand into position.
21. Narrow sterile field so stands are easily reached.
22. Pass surgeon sponges and instruments.
23. Keep Mayo Stand filled with needed instruments.
24. Test suction--Allow water to pass thru.
25. Hand circulator covered basin with discarded instruments.
26. Remove instruments used in the removal of specimen.
27. Prepare for closure of incision.
28. As operation nears finish, assemble all sterile instruments on table.
29. Check tape sponge count.
30. Remove drape from patient.
31. Remove all unused sterile supplies and instruments to proper room.
32. Prepare for following case while circulator cleans room.

Nineteenth Period - Two Hours  
Operating Room Suite

Place: Classroom

References: "Surgical Nursing," Eliason, Ferguson, Farrand, 6th Ed, pp 562-565, 576-577.

Instructional Aids:

Personnel: One man to direct conference

Equipment: Non-standard, mimeographed diagram of Operating Room suite.

Individual Equipment: Notebook and pencil

35th and 36th Hours:- Conference, Demonstration

Points to be Covered

1. Introduction:

a. The operating room suite is a set of rooms set aside from the rest of the hospital for the purpose of performing surgery.

b. It consists of operating and accessory rooms. The number and size of these rooms vary with the size of the hospital and the character and amount of work to be done.

c. It should be sufficiently isolated from the rest of the hospital to prevent annoyance or disturbance by sights, sounds, or odors, and yet near enough to the surgical wards so that they may be reached easily and quickly.

2. Explanation:

a. Operating room proper comes first in importance. Details of the set up of the operating room will be covered in a separate class. The essential features of the room are:

- (1) Size: large enough so that perfect aseptic technique can be carried out.
- (2) Construction should be such as to permit frequent washing.
- (3) Ventilation and heat are factors of great importance. Usual temperature is 78 to 80 degrees F. There must be an abundance of fresh air free from draughts, dust, etc.
- (4) Illumination is given special consideration.

b. Dressing Rooms

- (1) Dressing rooms must be provided for doctors, nurses and enlisted men.
- (2) Equipment of dressing rooms includes:
  - (a) Lockers
  - (b) Toilet facilities

c. Instrument Room

- (1) It is desirable to have a separate room for storing instruments. If such a room is not available instruments may be stored in cabinets in a room with other equipment.
- (2) Rooms and cabinets in which instruments are stored must be as free from moisture and dust as possible.

d. Sterile supply room

- (1) Equipped with shelves or cabinets in which to store sterile supplies.
- (2) Sterile supplies are stacked so that all similar supplies are together. This makes it easier to find them when they are needed.
- (3) No unsterile supplies should ever be taken into sterile supply room.

e. "Scrub up" room

- (1) Preferably opens directly into operating room but may open into corridor of operating suite.
- (2) Equipment:
  - (a) Scrub up sinks with single faucet for both hot and cold water. Faucet should be controlled with knee pedal.
  - (b) Soap dispenser for liquid soap controlled by foot pedal.
  - (c) Shelf above sink:

1. Container with caps
2. Container with masks
3. Container with sterile scrub brushes
4. Container with sterile orange wood sticks
5. Soap dishes with cake soap if no liquid soap dispenser is available.

- (d) Clock to time scrubbing

f. Sterilizing Rooms

- (1) Contain all sterilizing apparatus
  - (a) Autoclaves
  - (b) Water sterilizers
  - (c) Instrument sterilizers
  - (d) Utensil sterilizers
- (2) Separate tables for sterile and unsterile supplies
- (3) Doors should lead into operating room
- g. Utility Rooms (may be combined with sterilizing room.)
  - (1) Sinks and hoppers for washing and scrubbing instruments, utensils, gloves, etc.
  - (2) Large closet for floor brushes, mops, scrubbing brushes, buckets, etc.
  - (3) Glove drying racks.
  - ..
- h. Nurse's work room (may be combined with nurses' dressing room)
  - (1) Large work table
  - (2) Cupboards for storing unsterile supplies to be prepared for sterilization and use.
  - (3) Equipment as needed for preparing and making supplies used in the operating room.
- i. Anesthetizing Room
  - (1) Small table (If no separate room is available this table should be set up in the OR)
    - (a) Mouth gags
    - (b) Tongue forceps
    - (c) Emesis basin
    - (d) Airway
    - (e) Jar of vaseline or cold cream
    - (f) Small bottle of mineral oil
    - (g) Sterile eye dropper
    - (h) Sufficient cut gauze or kleenex
    - (i) Hand towels (2)
  - (2) Anesthesia machines and other equipment
- j. Storage room for infrequently used apparatus and for supplies. If no such room is available these supplies may be kept in cabinets in nurses work room.
  - ..
- k. Office

- (1) Desk for doctor anesthetist who is the responsible officer in the OR in the army.
- (2) Desk for nurse supervisor
- (3) Telephone
- (4) Bulletin board for schedules, notices, etc.
- (5) Stenographer's desk
- (6) Records

#### 1. Corridor of operating suite

- (1) Litters
- (2) Fire extinguishers
- (3) Lockers for enlisted men if room is not available in dressing room.
- (4) Soiled linen room is usually at end of corridor.

#### 3. Housekeeping of the Operating Suite

a. Between cases: the details of cleaning will be studied in another period.

##### b. Daily cleaning:

- (1) All floors must be swept and scrubbed.
- (2) Furniture washed with soap and water.
- (3) All doors, windows and doors of cabinets or built in cupboards and all sterilizers wiped off at least once daily.

c. Weekly cleaning: Usually roster is made out so that some of weekly cleaning is done each day.

- (1) Windows and glass doors washed.
- (2) Brass or nickel fixtures polished.
- (3) All cupboards, closets, cabinets and storage space cleaned, their contents checked and arranged neatly.

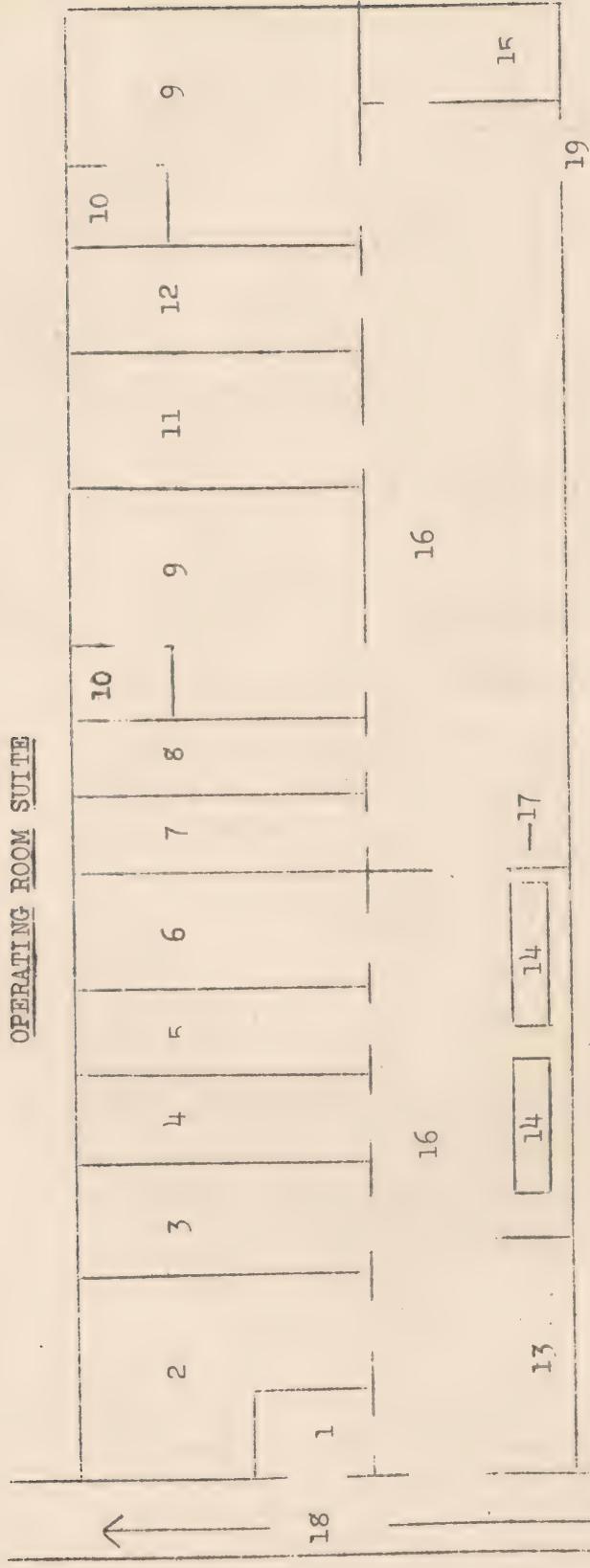
#### 4. Demonstration:

a. By use of the attached diagram the physical arrangement of the rooms in an operating suite may be demonstrated.

#### Training Notes:

1. Stress importance of flawless housekeeping in the operating suite.
2. Emphasize the importance of order in the operating suite.

OPERATING ROOM SUITE



Twentieth Period - Two Hours  
Operating Room Proper

Place: Classroom

References: "Surgical Nursing," Eliason, Ferguson, and Farrand, 6th Ed., pp 563-564, 566-572.

Instructional Aids:

Personnel: One man to direct conference; one man to act as demonstrator.

Equipment: Blackboard and chalk; Complete OR proper

Individual Equipment: Notebook and pencil

37th and 38th Hours - Conference, Demonstration

Points to be Covered

1. The operating room proper is that room in an operating room suite in which actual surgery is performed. It is the most important room in the suite. Accessory rooms may often be combined and function efficiently. But in the planning of any operating room suite the operating room proper is given first consideration.

2. Size and construction come first in importance.

a. Size should not be unnecessarily large and yet should not be so small as to interfere with perfect aseptic technique. In some overseas army hospitals the operating room is large enough for two tables but most operating rooms are planned for only one operation at a time. The room need only be large enough to contain necessary furniture with space for personnel to move around freely.

b. Construction must be of the simplest design. Walls should be free from corners and ledges and of such construction as to permit frequent washing. Washable paint, enamel or tiling are materials in general use. The floor is frequently graded downward slightly to the center, where there should be a drain to allow for flushing.

3. Ventilation and heat are also important factors. There should be an abundance of fresh air, without strong draughts, free from dust and other gross contamination. The temperature should be maintained around 78 degrees F. Radiators should be constructed to allow for easy cleaning and should be covered with cloth covers to prevent dust from collecting on them. These covers must be changed frequently. Air conditioning is ideal and has been installed in most army operating rooms.

4. Illumination of the operating room is another essential feature.

Windows are covered with permanent screening. Artificial light is almost always used for lighting the operative field. The ceiling light is provided with reflectors to eliminate shadows. Additional spot lights may be needed for special types of surgery. Many hospitals have auxillary lights which run on batteries to be used if the electricity fails. Floor plugs for attaching cautery, spot lights, etc., should be of sufficient number and situated conveniently near the operating table. Dust collecting wires and fixtures over the operating tables must be avoided. All plugs and outlets must be inspected frequently for any faults which might cause a short circuit. Since some anesthetic agents are highly inflammable sparks from electric fixtures are very dangerous in an operating room.

## 5. Equipment of the Operating Room

a. Only essential equipment should be kept in the operating room. It should be so arranged to permit maximum efficiency with a minimum expenditure of energy.

### b. Essential equipment:

- (1) Clock for timing anesthesia and operation
- (2) Operating table
  - (a) Type and make may vary considerably
  - (b) Rather complicated in construction and manipulation. Circulator must learn details so that he can arrange and adjust the proper position of the patient.
  - (c) Pad varies. Most desirable is an air mattress with rubber cover.
- (3) Instrument table, adjustable (Mayo Stand)
  - (a) The number of those varies with the size of the operating room, and kind of operations performed.
  - (b) Can be extended across the operating table and placed within easy reach of the surgeon.
- (4) Reserve table
  - (a) May vary in size -- usually  $2\frac{1}{2}$  by 4 ft. is large enough.
  - (b) Used for supplementary instruments and supplies.
  - (c) Should have rollers in order that it may be moved quickly and easily.
- (5) Accessory tables
  - (a) Table for sterile hand towels, gowns and gloves.

- (b) Small table for paints (antiseptics used in preparing patient's skin for surgery)
- (c) Small table for anesthetist's equipment.
- (6) Double basin rack for hand solutions
- (7) Adjustable stools for surgeon and anesthetist.
- (8) Utensils - the assortment and number vary.
  - (a) Basins, various sizes and shapes
  - (b) Pitchers, various sizes
  - (c) Trays, various sizes
  - (d) Buckets for soiled sponges
  - (e) Other utensils as required
- (9) Suction apparatus
- (10) Linen as needed
- (11) Drugs vary greatly. A wide variety of drugs may be kept in the operating suite, but only a minimum supply is kept in the operating room proper.
- (12) Other equipment, not essential but often seen in the operating room.
  - (a) X-ray view box
  - (b) One or two built in cabinets
  - (c) Drum stands and drums
  - (d) Soiled linen hamper
  - (e) Sponge rack
  - (f) Stools to varying heights for surgeon or his assistant to stand on.
  - (g) Special equipment to serve special needs.

## 6. Housekeeping of the operating room

a. The entire room and all of its equipment must be kept spotlessly clean and free from dust at all times.

b. Floors and furniture must be washed with soap and water when the day's operations are completed.

c. Walls may be hosed down periodically.

d. All dusting should be done with a damp cloth. All doors, windows and doors of built in cupboards should be wiped off once daily. Windows and glass doors should be washed weekly.

e. Brass and nickel fixtures should be polished weekly or more often if necessary.

f. Between cases, the floor should be mopped to remove any blood stains, water, etc., buckets and sponge racks emptied and cleansed.

## 7. Demonstration

a. Demonstrate care and arrangement of operating room equipment as available.

### Training Notes:

1. Stress care of equipment.
2. Emphasize housekeeping of the operating room.

### Twenty-First Period - Two Hours Surgical Instruments; The Types and Uses

Place: Classroom

References: TM 8-611; "Surgical Nursing," Eliason, Ferguson, Farrand, pp 586-591; "Principles and Practice of Nursing," Harmer and Henderson, pp 199-203.

### Instructional Aids:

Personnel: One man to direct conference; four (4) men to act as demonstrators.

Equipment: 4 Instrument tables; 2 basic Instrument Sets Complete

Individual Equipment: Notebook and pencil

39th and 40th Hours - Conference, Demonstration

### Points to be Covered

#### 1. Introduction:

a. Instruments vary in type according to their purpose and use. All instruments are expensive, not only in initial cost but in upkeep and repair. Different types of instruments must be recognized by the technicians in order that he may know their proper purpose and use. An instrument that is used for other than its designated use will not long remain a faultlessly working instrument. Instruments are precision tools which explains why their correct use is so important.

#### 2. Demonstration:

a. Each demonstration group will display half of the instruments from a basic set on instrument table and demonstrate various types of instruments explaining their purpose and use.

#### 3. Types of instruments, purpose and use:

##### a. Cutting instruments:

(1) Knives

- (a) Scalpel with attached blade. These vary in size and the shape of the blade according to their use. They may be used for special surgery such as delicate eye or ear surgery, minor surgery or for cutting casts, etc.
- (b) Knife with detachable blade (Bard Parker knife) Used for most surgery.
  - 1. Handles may vary in size and length depending on depth of cutting required or type of tissue to be cut.
  - 2. Blades vary in size and shape depending on type of surgery. Blades may be pointed or rounded, wide or narrow. They are numbered according to size. #20 is large and is used for initial skin incision. #10 and #15 are small and are used for cutting nerves, vessels and tissues.

(2) Scissors

- (a) Bandage scissors may be large or small. Used to cut bandage, gauze, adhesive, etc.
- (b) Dissecting scissors may be curved or straight; double blunt, one point sharp, or double sharp. Used for cutting tissues.
- (c) Suture scissors may vary as dissecting scissors but usually have one sharp and one blunt end. Used for cutting sutures.
- (d) Miscellaneous scissors of extremely delicate structure are used for special types of surgery such as ENT work.
- (e) Shears are another miscellaneous group used for less delicate cutting. There are office shears, plaster shears, rib shears (used in ~~chest~~ surgery), tin snips, etc.

(3) Miscellaneous cutting instruments:

- (a) Chisels used in bone surgery
- (b) Bone cutting forceps
- (c) Saws and drills used in bone surgery
- (d) Curettes (spoon shaped scrapers) which may be used on bone or soft tissues.

b. Forceps

- (1) Ring handled forceps includes various types of hemostatic, sponge, and grasping forceps. The vital parts are the

catches, lock, and paws. The variations in size, shape, and structure are many according to their intended use. (Examples as available to be shown to class)

( 2 ) Spring forceps also vary in size, shape, and structure according to intended use. Some are toothed and some are plain. They may be angled or straight. Some spring forceps are used to grasp or hold tissue while others are intended to use to apply sterile dressings.

c. Retractors are instruments designed to retract or hold back tissue so that the surgeon can see deeper tissues. They vary greatly in shape and size. Small four pronged rake retractors are used to hold back the skin or superficial tissues whereas abdominal retractors hold back the abdominal wall or abdominal organs. Delicate retractors are used in eye surgery. Some retractors are a single instrument used to hold back tissues on one side of an incision and must be held in place. Others are self retaining and may be placed in position and locked, holding an incision apart.

d. Miscellaneous Instruments

- ( 1 ) Probes are slender flexible rods used for exploring a wound.
- ( 2 ) Grooved directors are slender grooved instruments with a blunt tip used as a guide for cutting.
- ( 3 ) Specula are instruments introduced into a part to aid the doctor in seeing into that part. They vary in size and shape. There are nasal specula, ear specula, etc.
- ( 4 ) Scopes are instruments designed to enable a doctor to examine structures inside the body. Each is specially designed for its use and named accordingly: otoscope for the ear; laryngoscope for the larynx; bronchoscope for the bronchi; cystoscope for the urinary bladder; proctoscope for the rectum etc.
- ( 5 ) Suction tips are instruments attached to a suction machine and introduced into a part to suction off fluid. They are commonly introduced into the throat and abdomen. They are simply hollow metal tubes with specially designed tips.

Training Notes:

1. Stress comparison between surgical instruments and precision tools used in industry to emphasize delicacy of structure.
2. Emphasize using instruments only for their intended purpose.

Twenty-Second Period - Two Hours

## Blood Pressure and TPR Review

Place: Classroom

References: TM 8-220, pars 197-200; "Principles and Practice of Nursing," Harmer and Henderson, Ch 10..

Instructional Aids:

Personnel: One man to direct conference; One man per eight (8) students to supervise applicatory work.

Equipment: None

Individual Equipment: 1 sphygmomanometer per 2 students; 1 stethoscope, complete per 2 students; 1 thermometer tray, complete per every eight (8) students (See period Ten)

### 41st and 42d Hours - Conference and Application

#### Points to be Covered

##### 1. Introduction

a. Since the technician will be taking TPR and Blood Pressures frequently it is important that he be able to carry out these procedures quickly and accurately.

##### 2. Application (See WF, periods 8 and 10, for procedures)

a. Students working in groups of two practice taking each others blood pressure.

b. Students working in groups of four practice taking TPR.

#### Training Notes:

1. Supervise closely. Emphasize need for accuracy.

2. Stress that procedure for taking TPR is not complete until tray has been cleaned and replaced.

### Twenty-Third Period - Two Hours Review of Fractures, Dislocations, Sprains

Place: Classroom

References: "Orthopedic Nursing," Funstein and Caldewood

Instructional Aids:

Personnel: Three men, one to direct each problem

<u>Equipment:</u>	6 Triangular bandages	2 extra pillows
	1 Basswood splint	1 pr fracture boards
	3 rolls 2" gauze bandage	1 Balkan Frame, complete
	1 dozen ABD pads	1 Bath towel
	8 sheets	1 razor with blades
	3 pair pajamas	1 rubber draw shoot
	1 Thomas splint with Pearson attachment	1 pr hip spica cast shells
	1 bottle tr. green soap	1 rubber square
	3 pillow cases	1 roll 3" adhesive
	1 bottle ace adherent	1 patient unit
	1 roll bandage, elastic, self adherent	1 dozen 4x4's
		2 blankets
		1 emesis basin

Individual Equipment: Notebook and pencil

43d and 44th Hours - Conference, Demonstration, Application

Points to be Covered

1. Introduction

a. This is a discussion of problems and situations which may confront the technician in caring for orthopedic patients in the hospital.

2. Explanation and Discussion

a. Students are divided into three groups with an instructor assigned to each group. Each group is given a problem, namely a typical situation in the care of orthopedic patients. The groups are given time to plan the demonstration of problem--Each group presents problem to class.

b. Problems

(1) Problem #1

(a) Situation - at 0100 hours an ambulance arrives at the receiving office with two ambulatory patients. The O.D. is making rounds on the ward. T/4 Williams is at supper. Pfc. Harris is in the emergency room alone. Both patients had been given first aid at a civilian hospital and transferred to the Army Hospital.

1. The record attached to Sgt Thomas stated:  
Arrived at Emergency Hospital @ 2230 Hours.  
Diag:

- a. Multiple laceration left forearm.
- b. Possible fracture left wrist.
- c. Dislocation left shoulder.

Treatment:

- a. Morphine  $\frac{1}{4}$  gr (h) @ 2245 hrs
- b. 7 sutures H arm, vaseline gauze dressing.
- c. Dislocation reduced by manipulation.

2. The record attached to Pvt Jones stated:

Arrived at Emergency Hospital @ 2230 Hours.

Diag: Possible fractured jaw

Treatment:

- a. Morphine,  $\frac{1}{4}$  gr (h) @ 2245 hrs
- b. Jaw immobilized

(b) Suggested points for discussion:

1. Locating O.D. and T/4 Williams - Telephone operator.

2. Care until O.D. arrives

- a. TPR - axillary on mouth injuries
- b. Nothing to eat or drink - possibility of surgery.
- c. Undress patients - avoid further injuries by moving.
- d. Tetanus Toxoid and equipment ready to give.

3. Further duties

- a. X-Ray requests
- b. Assist doctor
- c. Notify ward

4. Possible examinations and orders

- a. X-Rays - (Routine for night emergency)
- b. Dental O.D. called to treat jaw case.
- c. Chemo therapy
- d. Morphine  $\frac{1}{4}$  gr PRN q4h.

(c) Suggested points for demonstration

1. Immobilization of fractured jaw.

2. Immobilization of wrist.

(2) Problem #2

(a) Situation - Ward notified of emergency admission--  
 Diag: Simple fracture, left femur - patient being brought to ward via x-ray. Prepare to put patient in traction. Doctor will accompany patient to ward.

(b) Suggested points for discussion:

1. Purposes of traction
2. Types of traction - advantage and disadvantages of each type

(c) Suggested points for demonstration:

1. Set up patient unit and make bed.
2. Set up Balkan frame.
3. Use fracture boards.
4. Assemble equipment for skin traction.

(3) Problem #3

(a) Situation - T/5 Horne is in the operating room for bone graft, left femur and application of hip spica cast.

(b) Suggested points for discussion:

1. Uses of bone grafts.
2. Reason for applying cast.
3. Points in caring for patients in cast.

(c) Suggestions for demonstration:

1. Set up patient unit to receive patient
  - a. Fracture boards
  - b. Post-operative bed.
2. Receiving patient from surgery - moving patient into bed.
3. Methods of drying cast.

Training Notes:

1. Instructor assigned to each group should be very familiar with his problem. His duty is to direct the discussion and demonstration.

2. Stress the duties of the technician in each situation.

Twenty-Fourth Period - Two Hours  
Review of Bandaging

Place: Classroom

References: FM 8-50, Section 2

Instructional Aids:

Personnel: One man to act as demonstrator; one man per eight students to supervise applicatory work.

Equipment: 2 triangular bandages  
2 rolls 3" muslin bandage  
2 rolls each of 2", 3", 4" muslin bandage  
1 roll elastic bandage

Individual Equipment: 1 triangular bandage  
1 roll 3" muslin bandage

45th and 46th Hours - Conference, Demonstration, Application

Points to be Covered

1. Introduction

a. The proper bandage, properly applied, can aid in the recovery of the patient. A carelessly or improperly applied bandage can cause discomfort to the patient and may imperil his life. The medical technician should become familiar with various bandages and be able to apply them properly.

2. Explanation and Demonstration

a. Use of bandages (should never be used directly over a wound. Should only be used over a dressing.)

- (1) To hold dressings
- (2) To secure splints
- (3) To create pressure
- (4) To immobilize parts
- (5) In correcting deformity.

b. Basic Materials

- (1) Gauze - most frequently used as it is light, soft and easily applied.
- (2) Flannel - soft, easily applied, absorbs moisture and maintains body heat.
- (3) Crinoline - used to make plaster of paris bandages
- (4) Muslin - strong, inexpensive, and can be used more than once.
- (5) Elastic webbing - used to apply pressure to the part.

## c. Types of Bandages

(1) Triangular bandage - used for the temporary or permanent dressing of wound fractures, dislocations, slings, and to hold other dressings in place. Unbleached muslin is generally used.

- (a) Triangle of forehead or scalp - used to retain dressings on forehead or scalp. Demonstrate.
- (b) Cravat of jaw - used to retain dressings on the chin, cheeks, and scalp and to temporarily immobilize jaw. Demonstrate.
- (c) Triangular arm sling - used for fractures or injuries of hand, wrist, and forearm. Demonstrate.
- (d) Triangle of shoulder - used to hold dressings on shoulder. Demonstrate.
- (e) Cravat of elbow - used to hold dressings around elbow. Demonstrate.
- (f) Triangle of hand - used to hold dressings of considerable size on the hand. Demonstrate.

(2) Roller Bandages - made of gauze, muslin, flannel or elastic webbing. For convenience and ease of application the slips are rolled.

- (a) Rules - (Never start or anchor bandage directly over wound)
  - 1. The roll should be held in the right hand so that the loose end is on the bottom.
  - 2. The outside surface of the loose end is applied to and held on the part by the left hand.
  - 3. The roll is then passed around the part.
  - 4. Two or three turns of the bandage should overlie each other to secure the bandage.
  - 5. The bandage should be applied evenly, firmly, and not too tightly. (See FM 8-50 page 19 for other rules)
- (b) Fastening the bandage - fasten securely by tying, safety pins, or adhesive tape.
- (c) Removing the bandage - bandage scissors are preferable. Interference with dressing should be avoided.
- (d) Types:
  - 1. Spiral bandage - used to retain dressings and compresses on the arm, leg, chest, or abdomen. Demonstrate

2. Finger bandage - used to hold dressing on finger. Demonstrate
3. Procedures - see reference
4. Application

a. Students apply each type of bandage on each other following each demonstration.

Training Notes:

1. Emphasize that roller bandages must be anchored and fastened securely.
2. Stress that muslin and elastic bandages may be used again after washing.
3. Stress that bandage should be evenly, firmly, but should not interfere with the circulation of the part.
4. Stress that roller bandage should never be started or anchored directly over wound.

Twenty-Fifth Period - Two Hours  
Review of Splinting

Place: Classroom

References: FM 8-50, Section 3

Instructional Aids:

Personnel: One man to act as demonstrator; one man per six students to supervise applicatory work.

Equipment: 1 army hinged half-ringed leg splint  
8 triangular bandages  
1 wire ladder splint  
1 roll cotton wadding  
2 rolls 3" muslin bandage  
2 basswood splints

Individual Equipment: One army hinged half ringed leg splint per four students.

Per two students:

4 triangular bandages	2 rolls 3" muslin bandage
1 wire ladder splint	age
1 roll cotton wadding	2 basswood splints

47th and 48th Hours - Conference, Demonstration, Application

Points to be Covered**1. Introduction**

a. Splints are devices used for the fixation of broken bones. Since it is often the duty of the medical technician to apply splints, both as an emergency and in the hospital he should become skilled in their application.

**2. Explanation**

a. Purpose - to immobilize the part. Proper splinting of a fracture prevents the occurrence of or increase of:

- (1) Shock
- (2) Damage to muscles, nerves, and blood vessels
- (3) Damage to bone
- (4) Infection

b. Every fracture of a long bone should be splinted "where they lie."

**3. Demonstration (see FM 8-50 for procedure)**

a. Demonstrate application of army hinged, half-ringed leg splint.

b. Demonstrate application of wire ladder splint to lower position of leg.

c. Demonstrate application of basswood splint for fracture of forearm, wrist, or hand.

d. Demonstrate application of board splint for fracture of arm.

**4. Application**

a. Students, working in groups of four, apply army log splint.

b. Students, working in groups of two, apply wire ladder splint, basswood splint, and board splint.

Training Notes:

1. Emphasize that all fractures of long bones should be splinted before the patient is moved.

2. Point out that special equipment is not necessary, any handy articles, as broom handle, etc, may be used.

3. Stress that splint should be held securely, but bandage should not interfere with circulation of the part.

Twenty-Sixth Period - One Hour  
Miscellaneous Supplies

Place: Classroom

References: "Surgical Nursing," Eliason, Ferguson, Farrand, 6th Edition,  
pp 600-606

Instructional Aids:

Personnel: One lecturer

<u>Equipment:</u>	Gauze strips	2" gauze bandage
	Vaseline	Adhesive 2" and 1"
	Brown paper	Muslin wrappers
	Jars	Bandage scissors

Individual Equipment: Notebook and pencil

49th Hour - Conference, Demonstration

Points to be Covered

1. Introduction

a. Miscellaneous supplies include those supplies not already discussed. Some of these supplies require special preparation and care or are used for special purposes.

2. Explanation

a. Gauze packing

- (1) Fine meshed gauze strips with selvaged edge of different widths.
- (2) May be cut to desired length, wrapped in brown paper or muslin or placed in container with cover and autoclaved.
- (3) Use: To pack wounds to prevent too rapid closure and to check drainage.

b. Vaseline Gauze (petroleum jelly)

- (1) Fine meshed bandage or gauze packing of different widths and lengths into which vaseline has been melted.
- (2) Preparation
  - (a) Cut strips to desired length and place in glass or metal container layer upon layer.

- (b) Put sufficient vaseline on top of strips to melt down through all layers.
- (c) Autoclave with cover to container.
- (d) On completion of autoclaving place cover on container. Strips of vaseline gauze may be removed from container as needed by using a sterile forcep.

(3) Uses:

- (a) To protect the area around a wound from irritating drainage.
- (b) As a burn dressing.
- (c) Vaseline gauze packing may be used in wounds.
- (d) On healing wounds to prevent gauze from sticking to wound.

c. Paraffin gauze: Gauze impregnated with paraffin (wax) sometimes used for the same purposes as vaseline gauze.

d. Iodoform gauze:

- (1) Iodoform is a compound containing iodine. It acts as a mild antiseptic. It absorbs fluids from a wound and in this way prevents the growth of bacteria. It has a very characteristic odor.
- (2) Iodoform gauze is gauze packing impregnated with iodoform.
- (3) Use: It is sometimes used in infected wounds to check infection and drainage.

e. Montgomery or PRN straps:

- (1) Definition: A special type of strap made with adhesive tape and ties to hold dressings in place.
- (2) Making Montgomery straps:

- (a) Cut strip of 2 inch adhesive about 9 inches long.
- (b) Fold back 2 inches of the adhesive, sticky side inside.
- (c) Cut hole in folded back end of strap.
- (d) Fasten tie through hole in strap.

(3) Use of Montgomery straps:

- (a) Place straps on opposite sides of the dressing with folded ends near the edge of the dressing.
- (b) Tie ties over dressing to hold it in place. Length of ties depends on size of dressing.

(c) Two or three pairs of straps may be needed for a large dressing.

(4) Advantages:

(a) Frequent changes of dressings are made easier.

(b) Skin is not irritated so much as when adhesivo is removed and replaced with each change of dressing.

f. Butterfly straps:

(1) Special shaped adhesive straps used to hold the edges of a wound together.

(2) Making Butterfly straps:

(a) Cut strip of 1 inch adhesive about 4 inches long.

(b) Make diagonal cuts toward the center about  $1\frac{1}{2}$  inches from each end  $1/3$  of the way across leaving a strip  $1/3$  the width of the adhesive uncut in the center.

(c) Fold cut out wedge back on center strip with sticky side inside.

(d) Completed strap has full width ends of adhesivo tape connected by narrow strip of 3 thicknesses.

(3) Use:

(a) Place one end of Butterfly strap on one side of wound and pull slightly toward wound.

(b) Holding wound together fasten other end of strap on opposite side of wound.

3. Demonstration

a. Demonstrate each item as discussed.

b. Demonstrate cutting and wrapping gauze packing for sterilization.

c. Demonstrate preparation of vaseline gauze.

d. Demonstrate making and applying Montgomery straps and Butterfly straps.

Training Notes:

1. Stress special use of each item in miscellaneous supplies.

2. Stress making Montgomery straps and Butterfly straps.

Twenty-Seventh Period - One Hour

Autoclaving: Purpose; Use; and Operation

Place: Classroom

References: "Surgical Nursing," Eliason, Ferguson, and Farrand, pp 577-582; "The Principles and Practice of Nursing," Harmer and Henderson, pp 175-185

Instructional Aids:

Personnel: One man to act as demonstrator

Equipment: One autoclave

Individual Equipment: Notebook and pencil

50th Hour:- Conference and Demonstration

Points to be Covered

1. Review of terms (See Lesson plan for first period)
2. Review thermal method of sterilization by steam under pressure. (See Lesson Plan for first period)
3. Review general principles for operation of autoclave. (See Lesson Plan for first period)
4. Demonstration
  - a. Operation of autoclave:
    - (1) Arrange articles to be sterilized on rack so that no surface of one article touches any surface of another.
    - (2) Insert control indicator in each package.
    - (3) Admit steam into outer jacket until the pressure of 15-20 pounds and temperature up to 250-260 degrees F is reached, thus heating interior chamber.
    - (4) Introduce rack with articles to be sterilized into chamber.
    - (5) Close chamber door and lock.
    - (6) Allow air to escape from inner chamber through drain valve.
    - (7) Close drain valve.
    - (8) Allow steam to enter inner chamber until 15-20 pounds pressure and temperature is about 250-260 degrees F has been produced.
    - (9) Begin to time sterilizing process at this point.
    - (10) At end of sterilizing time, operating valve is turned to exhaust, and drain valve is opened.

- (11) When chamber gauge registers zero allow to remain from 5-10 minutes to allow materials to dry, or until temperature in autoclave drops to 200 degrees F if materials being sterilized are liquids in containers
- (12) Open door, remove rack.
- (13) Check control indicators.
- (14) Remove sterilized articles from rack, label with date of sterilization, and place in clean dry place for storage until used.

Training Notes:

1. Stress that only an authorized person may operate an autoclave.
2. Stress complete understanding of sterilizing process.
3. Place entire emphasis on the operation of the autoclave.

HYGIENE AND PREVENTION OF DISEASE

(7)

PERIOD	HOURS	WEEK	SUBJECT
1	1	1	Classification of Disease; Classification of Disease Producing Germs
2	2	1	Personal Hygiene
3	1	1	Bacteria
4	1	2	Disease Producing Germs
5	2	2	Communicable Diseases
6	2	3	Respiratory Diseases
7	2	3	Intestinal Diseases
8	1	3	Typhoid Fever and Cholera
9	2	3	Dysenteries and Diarrheas
10	2	4	Malaria and Dengue
11	1	4	Other Insect borne Diseases
12	2	5	Water: Purification and Water Discipline
13	2	5	Waste Disposal
14	3	6	Venereal Diseases
15	1	6	Tropical Warfare
16	1	7	Personality Disorders
17	2	8	Chemical Warfare
18	1	8	Tropical Warfare - Medical Consideration
19	1	8	Personal Hygiene Review
19	30		TOTAL

1. Purpose and Scope: The purpose of this subject is to give trainees a basic knowledge of those diseases which are of military importance. Emphasis is placed on the methods of control and prevention of these diseases with special emphasis on personal health measures. The course will include the following specific information:

Classification of diseases and disease producing germs  
Personal Hygiene: food, water, vitamin requirements in health and disease  
Bacteria: structure, growth and reproduction, toxin production  
Communicable diseases and their control  
Respiratory diseases and their control  
Intestinal diseases and their control  
Typhoid fever and cholera  
Dysenteries and diarrheas  
Malaria and Dengue Fever  
Other insect borne diseases and their control  
Water purification and discipline  
Waste disposal  
Venereal diseases and their control  
Tropical warfare: general and medical considerations  
Personality disorders  
Chemical warfare

2. References and Training Aids:

TM 8-227	FM 8-40
TM 8-229	FM 8-45
TM 8-220	FM 21-10
TM 8-285	FM 31-20
	FM 70-15

TB Med 14, 31, 37, 42, 47, 65, 72, 96,  
106, 112, 114, 119, 159, 164

TF 1-3347	TF 8-1180
TF 3-1407	TF 8-1297
TF 3-2016	TF 8-1396
TF 8-155	TF 8-1423
TF 8-999	TF 8-1467
TF 8-1174	TF 8-2057
TF 8-1179	

Misc 1035	Misc 157
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FB 99	TB 147
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FS 8-52	FS 8-60
FS 8-53	FS 8-63

3. Standard of Proficiency: Familiarity with bacteria and their characteristics. Communicable diseases and their control; insect borne diseases and their control; purification of water; disposal of waste; and care of tropical diseases. Venereal diseases and their control. Fundamentals of chemical warfare agents and protective measures against same. Students will pass tests to show their knowledge of the subjects.

First Period - One Hour  
Classification of Disease; Classification of  
Disease Producing Germs

Place: Classroom

References: TM 8-227, Ch 9; TM 8-220, pars 228-230; Military Preventive Medicine - Dunham

Instructional Aids:

Personnel: Lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

1st Hour - Lecture

Points to be Covered:

1. Introduction

a. Historical background - relation of disease and epidemics to military campaigns. (Typhus beat Napoleon in Russia.)

b. Role of Army in developing Preventive Medicine. (Foremost in this field since it had to maintain fighting strength.)

c. Orientation as to what is contained in the subject of Hygiene and Prevention of Disease. Causes and factors in prevention of disease.

2. Explanation

a. Definition of:

- (1) Disease: Any departure from a state of health.
- (2) Hygiene: The science of health and its preservation.
- (3) Sanitation: The establishment of environmental conditions favorable to health.

- (4) Preventive Medicine: That branch of medicine which aims at the prevention of disease. (Locking the stable before the horse is stolen.)
- (5) Case: A person actually ill with a disease.
- (6) Carrier: A person who, although not ill, is giving off from his body organisms or viruses capable of causing disease.
- (7) Contact: A person who has been closely associated with a sick person.
- (8) Suspect: A person who has been exposed to a communicable disease and is ill, but in whom the symptoms and signs are insufficient to warrant a diagnosis of the particular disease.
- (9) Contamination: Soiling by the infectious agent or by discharges containing the infectious agent.
- (10) Disinfection: The destruction or great weakening of the infectious agent by physical or chemical means.

b. Types of Diseases:

- (1) Contagious or communicable diseases:
  - (a) Caused by bacteria or virus.
  - (b) Transmitted from one person to another by direct or indirect contact.
- (2) Metabolic diseases:
  - (a) Caused by abnormal behavior of the glands of internal secretion resulting in an imbalance of their functions.
  - (b) Examples - gout and diabetes.
- (3) Deficiency diseases
  - (a) Diseases due to lack of essential elements in foods or to inability of the individual to absorb these essential elements (vitamins) even if they are present.
- (4) Functional diseases:

(a) Diseases which have no organic basis and are due to abnormal mental behavior.

(b) Example - nervous breakdown.

(5) Neoplastic diseases:

(a) Due to overgrowth of cells.

(b) Examples - carcinoma, sarcoma.

c. Five Groups of Communicable Diseases:

(1) Respiratory diseases:

(a) Those diseases, the infective agents of which are usually disseminated in the secretions from the respiratory tract.

(2) Intestinal diseases:

(a) Those diseases, the infective agents of which are discharged from the body in the feces and urine, and usually transmitted by food and water. The point of entry is the gastro-intestinal tract.

(3) Insect borne diseases:

(a) Those diseases that are usually transmitted by blood-sucking insects.

(b) Examples - Malaria, Dengue, Typhus, Rock Mountain Spotted Fever, Yellow Fever.

(4) Venereal diseases:

(a) Those diseases usually transmitted by direct contact during sexual intercourse.

(5) Miscellaneous diseases:

(a) A group of communicable diseases which do not fit into any of the other categories.

(b) Examples - Ringworm, Foot Itch.

d. Classes of Disease Producing Organisms:

(1) Bacteria - One celled micro-organisms that possess the biological characteristics of plants:

- (a) Coccidi
- (b) Bacilli
- (c) Spirilli
- (d) Filterable Viruses

(2) Protozoa - One celled micro-organisms that possess the biological characteristics of animals:

- (a) Rhizopoda
- (b) Flagellata
- (c) Sporoza

Second Period - Two Hours  
Personal Hygiene

Place: Classroom

References: TM 8-220, pars 246-247; FM 21-10, Ch 13; FM 70-15

Instructional Aids:

Personnel: Lecturer; projectionist

Equipment: Blackboard; TF 8-155 (36 min); TF 8-1297 (19 min); movie projector and screen

Individual Equipment: Notebook and pencil

2d & 3d Hours - Lecture, Demonstration, Discussion

Points to be Covered:

1. Introduction:

- a. Soldier's own responsibility to keep himself fit for duty.
- b. Need for increased vigilance regarding personal hygiene.
- c. There are both individual and group measures to be followed with regard to hygiene and health.

(1) Prompt reporting on sick calls is an important individual measure. Should be especially watchful for and report:

- (a) Colds
- (b) Headache
- (c) Sore eyes
- (d) Diarrhea
- (e) Fever
- (f) Abdominal pain associated with vomiting

## 2. Explanation:

a. Measures to maintain and improve general health and resistance.

- (1) Adequate housing and clothing
- (2) Adequate food and water
- (3) Physical activity
- (4) Adequate sleep
- (5) Avoid over fatigue and exposure to elements
- (6) Mental hygiene, morale factors, recreation

b. Care of the body

- (1) Proper bathing: hands, head, contagious areas
- (2) Clothes: climatic adjustments, cleanliness
- (3) Mouth: teeth and gums
- (4) Feet: shoes, socks (proper size and care)
  - (a) Blisters
  - (b) Toenails
  - (c) Athlete's foot
  - (d) Foot inspections
- (5) Ears: cleanliness of auditory canal
- (6) Body insect pests; e.g., lice, fleas, ticks, scabies
  - (a) Methods of avoiding
- (7) Gastro-intestinal tract
  - (a) Avoiding constipation
  - (b) Use of laxatives and dangers of same
- (8) Contaminated personal articles - contact with:
  - (a) Towels
  - (b) Pipes
  - (c) Glasses
  - (d) Toilet articles
- (9) Water discipline
  - (a) Hot weather requirements
  - (b) Relation to salt intake

## 3. Demonstration:

a. TF 8-155 (Personal Hygiene)

b. TF 8-1297 (Personal Health in Snow and Extreme Cold)

4. Discussion

5. Prepared Questions

6. Summary

Third Period - One Hour  
Bacteria

Place: Classroom

References: TM 8-227, Ch 9, Sec I; Military Preventive Medicine - Dunham; Preventive Medicine - Rosenau; Bacteriology - Zinser

Instructional Aids:

Personnel: Lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

4th Hour - Lecture

Points to be Covered:

1. Introduction:

a. Story of Pasteur: Discovery of bacteria; saving of French wine industry; and rabies.

2. Bacteriology

a. The study of microscopic organisms:

(1) Organisms cannot be seen with unaided eye, only with powerful microscope.

(2) Some organisms (e.g. virus) have become visible only recently with the aid of ultra-microscope.

(3) These organisms are either plants or animals:

(a) Bacteria

(b) Protozoa

(4) Some produce disease in man, some in animals, some in both, and a large group produce no disease at all, in fact will be found beneficial to mankind.

(5) They are universally present:

- (a) On the surface of all objects.
- (b) No object can escape their presence.
- (c) Not all types are present in all communities.

1. Some areas are richer in one form or another.  
2. Some areas are poorer or have none.

3. Bacteria:

a. Definition:

(1) Microscopic single celled organisms that behave biologically like plants.

b. Classified according to pathogenicity:

(1) Pathogenic to man; i.e., able to produce disease in man.

- (a) These form the smaller group.
- (b) Utmost importance to man and medical profession.
- (c) Understanding of this is necessary as a basis for:

1. Sterilization  
2. Isolation  
3. Asepsis  
4. Antiseptics, etc.

(d) Present on all objects unless specific measures are taken for eradication.

(e) Exhibit specifically:

1. One organism can cause a particular type of disease; i.e., the organism that causes a common cold cannot cause scarlet fever.

(f) Remember: not all diseases are caused by micro-organisms.

1. Some are due to degeneration.  
2. Some are due to malfunction.  
3. Some are due to nerve growths.  
4. Some are due to imbalance, etc.

(g) Those diseases caused by living organisms are called infectious diseases.

1. If these are capable of being transmitted from one person to another they are called communicable diseases.

(2) Non-pathogenic

- (a) Form the largest group.
- (b) Some are useful to man.

1. Used in production of cheese, wine, butter, milk, etc.

c. Classified according to structure:

(1) Coccii: round, ball-shaped bacteria.

(a) Staphylococci

- 1. Grow in clusters
- 2. Cause pus formation

(b) Streptococci

(c) Diplococci

(2) Bacilli are long rod-shaped bacteria

(a) Typhoid bacilli

(b) Tubercl bacilli

(c) Diphtheria

(d) Tetanus

(e) Cholera

(3) Spirilla: corkscrew-shaped bacteria

(a) Vincent's spirilla

(b) Treponema pallida

(4) Filterable virus

3. Protozoa: a group of micro-organisms that are in their biologic properties like animals.

- a. Rhizopoda (amebic dysentery)
- b. Flagellata (sleeping sickness)
- c. Sporozoa (malaria)

4. Other factors concerning bacteria:

- a. Motility

(1) Some are motile:

- (a) Move by undulating.
- (b) Move by flagella

(2) Others are not motile

b. Factors influencing growth and reproduction - speed of growth.

- (1) Temperature
- (2) Moisture
- (3) Light
- (4) Food
- (5) Oxygen
- (6) Chemicals

c. Spore formation.

## 5. Production of toxins.

a. Definition: A poisonous substance secreted only by some bacteria.

- (1) Exotoxin: released while bacteria is living.
- (2) Endotoxin: held in bacteria until they die.

### Fourth Period - One Hour Disease Producing Germs

Place: Classroom

References: TM 8-227, Ch 8, Sec I; Military Preventive Medicine - Dunham; Preventive Medicine - Rosenau; Communicable Diseases - Top

Instructional Aids:

Personnel: Lecturer; projectionist

Equipment: Blackboard and chalk; TF 8-1396 (11 min); movie projector

Individual Equipment: Notebook and pencil

5th Hour - Lecture

### Points to be Covered:

1. Introduction

a. Analogy of infection or disease to two armies on the battlefield.

2. Explanation of factors responsible for the development of disease.

a. Invading Army

(1) Invading micro-organisms

- (a) The number of micro-organisms
- (b) The strength of micro-organisms

(2) Weapons used

- (a) Multiplication
- (b) Toxin formation
- (c) Tissue damage

b. Route of attack: Transmission methods

(1) Direct

(2) Indirect contact

(a) To be covered later

c. Defending position

(1) Resistance insufficient to overcome the invading organisms; i.e., body defenses.

3. The body defenses

a. First line

(1) Skin and mucus membranes

- (a) Most bacteria cannot enter unbroken skin or mucus membrane.
- (b) Tears
- (c) Mucus and cilia of respiratory tract
- (d) Secretions of digestive tract

b. Second line

(1) Phagocytes: WBC and body tissue cells

- (a) Swallow or engulf bacteria and kill them
- (b) Increase in number at site of infection

## c. Third line

## (1) Immune substances

## (a) Antibodies

1. Invading bacteria are foreign proteins that stimulate body to produce antibodies which are:

- a. Bacteriolysins - explain
- b. Opsonin
- c. Agglutinin

2. Specific toxins stimulate the body to produce antitoxin:

- a. Antibodies for one bacteria or disease will not fight other bacteria - e.g.

## d. Fourth line

## (1) Lymphatics: contain phagocytis and immune substances

## (2) Lymphglands: strain one bacteria

## 3. Some factors that lessen body defense

- a. Injury
- b. Chill
- c. Exposure
- d. Fatigue
- e. Malnutrition
- f. Individual variations

- (1) Anatomic
- (2) Indocrine, etc.

## 4. Immunity

a. Hereditary: Power of resisting an infection as a result of natural heritage.

- (1) Species - e.g.
- (2) Racial - e.g.

b. Acquired: Resistance obtained exclusive of heredity.

(1) Active: Resistance or antibodies built by patient.

(a) Natural

1. Person has disease

(b) Artificial

1. Vaccinations: weakened or dead bacteria

2. Toxoid: weakened solution of toxin; explain

a. Antibodies do not last forever.

b. Vaccination must be repeated sometimes.

(2) Passive: Antibodies are given to person.

(a) Natural

1. Maternal transmission

(b) Artificial

1. Serum - e.g.

## 5. TF 8-1396 (Body Defenses Against Disease)

Fifth Period - Two Hours

Communicable Diseases

Place: Classroom

References: TM 8-220, pars 228-230; Military Preventive Medicine - Dunham; Preventive Medicine - Rosenau; TB Mod 47 and 114

Instructional Aids:

Personnel: Lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

6th & 7th Hours - Lecture

Points to be Covered:

1. Introduction

a. Importance of communicable diseases

(1) General mission of the Medical Department is to preserve the fighting strength of the Army.

- (a) A man ill with diarrhea is no more useful than a man dead; in fact, is more of a burden.
- (b) Until 1917, more men died of preventable diseases than of battle wounds.
- (c) The loss of effective fighting power through disabling diseases is still a major problem.

### 2. Definitions

- a. **Infectious disease:** A disease that is caused by a micro-organism.
- b. **Communicable disease:** A disease that is caused by a micro-organism and can be spread to another person.
  - (1) Example to distinguish the foregoing; e.g., Pyelitis or nephritis and measles.
- c. **Endemic:** A disease which is communicable and which remains localized in one community.
- d. **Epidemic:** When a disease attacks many people in any region at the same time; widely diffused and rapidly spreading.
- e. **Carrier:** One who harbors and transmits a disease without having the symptoms of the disease.
- f. **Excreta:** Respiratory secretions, feces, wine, vomitus, and perspiration.
- g. **Discharges:** Includes excreta and any other matter eliminated from the body.
- h. **Contaminated:** Soiled by the infectious agent or by discharge containing the infectious agent.

### 3. Spread of disease

- a. The spread of disease may be likened to a chain.
  - (1) Link one: Source (case, carriers, animals)
  - (2) Link two: Actual transmission
    - (a) Direct (requires only two (2) persons)
      - 1. Contact of skin or mucus membranes
        - a. Intercourse in V.D.
        - b. Kissing: in V.D., in Respiratory Diseases

- c. Hands in Typhoid Fever
- d. Bite in Rabies

2. Droplet infection: in respiratory diseases

(b) Indirect (requires two (2) persons and intervening object or substance)

- 1. Foods, water, milk
- 2. Objects; e.g., soiled clothes, toothbrush, pipe, books, drinking glasses, etc.
- 3. Airborne; e.g., dust or sweeping
- 4. Insects

- a. Mechanical
- b. Feces of insect are rubbed in by a scratch
- c. Biting; e.g., malaria, blood sucking

(3) Link three: The susceptibles - those who will develop the disease if infected with the organisms of that disease.

4. Communicable diseases are classified according to the principal methods of transmission.

a. Respiratory Borne Diseases: The organisms are transmitted from one person to another in the secretions of the respiratory tract.

- (1) Chicken Pox
- (2) Common cold
- (3) Diphtheria
- (4) Influenza
- (5) Measles
- (6) German Measles
- (7) Mumps
- (8) Smallpox
- (9) Pneumonia
- (10) Meningococccic Meningitis
- (11) Streptococccic Throat
- (12) Septic sore throat
- (13) Scarlet Fever
- (14) Tuberculosis
- (15) Vincent's Disease
- (16) Whooping Cough

b. Intestinal Diseases: Organisms are transmitted from one person to another in the urine or feces.

- (1) Typhoid Fever
- (2) Paratyphoid Fever.

- (3) Cholera
- (4) Amebic Dysentery
- (5) Bacillary Dysentery
- (6) Food poisoning
- (7) Worm infestations
- (8) Undulant Fever

c. Insect Borne Diseases

- (1) Malaria
- (2) Dengue
- (3) Typhus Fever
- (4) Trench Fever
- (5) Relapsing Fever
- (6) Bubonic Plague
- (7) Yellow Fever
- (8) Filariasis
- (9) Rocky Mountain Spotted Fever
- (10) Tularemia
- (11) Tick paralysis
- (12) Pappataci Fever
- (13) Leishmaniasis - sand fly
- (14) Trypanosomiasis - fly

d. Venereal Diseases: Transmitted from one person to another by bodily contact; i.e., sexual intimacy, less often by indirect contact.

- (1) Syphilis
- (2) Gonorrhea
- (3) Chancroid
- (4) Lymphogranuloma inguinale
- (5) Granuloma inguinale

e. Miscellaneous Diseases

- (1) Athlete's Foot
- (2) Tetanus
- (3) Rabies
- (4) Scabies

5. General Methods of Control.

a. Sources of infection:

- (1) Case - isolation
- (2) Cancer - treatment or education
- (3) Contact

- (a) Quarantine, absolute - explain
- (b) Quarantine, modified - explain

b. Transmitting agents:

- (1) To be taken up later

c. Susceptible individual:

- (1) Immunization and vaccination
- (2) Maintain resistance

- (a) Proper nutrition, exercise, etc.

- (3) Personal hygiene.

Sixth Period - Two Hours  
Respiratory Diseases

Place: Classroom

References: TM 8-220, pars 232-233; Preventive Medicine - Rosenau; Military Preventive Medicine - Dunham; Internal Medicine - Yates; TB Med 112, 37, 114

Instructional Aids:

Personnel: Lecturer; projectionist

Equipment: Blackboard and chalk; FS 8-63; film strip projector; screen

Individual Equipment: Notebook and pencil

8th & 9th Hours - Lecture

Points to be Covered:

1. Importance of Respiratory Diseases:

a. Cause the greatest depletion of fighting strength.

b. Most common cause for admission to sick report.

c. In first World War of four million troops there were 783,895 cases of flu admitted, with 24,575 deaths due to complications, as pneumonia.

2. Respiratory Borne Diseases: Transmitted from one person to another by the secretion of the respiratory tract.

a. Chicken Pox

b. Common cold \*

c. Diphtheria

- d. Influenza \*
- e. Measles
- f. German Measles
- g. Mumps
- h. Smallpox
- i. Pneumonia
- j. Meningococcic Meningitis \*
- k. Streptococcic infection of upper respiratory tract
- l. Septic sore throat
- m. Scarlet Fever
- n. Tuberculosis
- o. Vincent's Disease
- p. Whooping Cough

(1) Those diseases marked by \* are to be discussed regarding:

- (a) Definition
- (b) Method of transmission
- (c) Incidence and prevalence
- (d) Signs, symptoms, and diagnostic points
- (e) Prognosis
- (f) Special points in prophylaxis and prevention
- (g) Other diseases to be discussed at desire of students.

(2) Common cold

- (a) Definition: Characterized by localized or general catarrhal inflammation of the upper respiratory tract and in the more severe forms by fever, headache, malaria, and prostration.
- (b) Transmission: From case by direct and indirect contact via respiratory discharges.
- (c) Very prevalent, very infectious, therefore high incidence and therefore gives many non-effectives.
- (d) Runny nose, headache, watering eyes, fever, malaria.
- (e) Prognosis: All recover.
- (f) Prophylaxis: Personal hygiene, prompt treatment of cases, prevention of overcrowding, adequate ventilation.

(3) Influenza

- (a) Definition: An acute, highly infectious disease

caused by virus and involving the general body system and respiratory tract.

- (b) Transmission: Direct and indirect, airborne.
- (c) Incidence and prevalence: Occurs in pandemic cycles in epidemic form. Explosive spread. Occurs in great quantity every few years.
- (d) Sudden onset, fever, muscular discomfort, respiratory symptoms, prostration.
- (e) Prognosis good if no complications, but very often severe pneumonia develops as a complication.
- (f) Maximum spacing in living quarters, reduction of crowding. Nothing really reduces final incidence, merely slowed up.

(4) Meningococcic Meningitis

- (a) Definition: An acute infectious disease caused by the meningococcus and characterized by meningeal inflammation in most cases.
- (b) Transmission: Usually by carriers and by contact between carriers and susceptibles. Infectious element in upper respiratory tract secretions.
- (c) Incidence and prevalence: In childhood and early adult life. More during winter months. May occur sporadically or in epidemic form.
- (d) Signs and symptoms: Headache, fever, mental clouding, stiff neck, may have a rash.
- (e) Prognosis: Good now with sulfadiazine and penicillin.
- (f) Prevention and Prophylaxis: Personal hygiene, avoidance of crowding of troops, throat cultures of possible carriers and contacts. Daily physical examinations when epidemic; Prophylactic - Sulfadiazine.

3. Important factors concerning the prevention and control of respiratory diseases.

a. Maintain resistance

- (1) Nutrition
- (2) Exercise
- (3) Proper clothing
- (4) Avoid fatigue
- (5) Adequate sleep and rest
- (6) Avoid overcrowding in closed places; e.g., movies
- (7) Immunization procedures
  - (a) Smallpox
  - (b) Diphtheria

b. Important points if an individual has a respiratory infection:

- (1) Report to sick call immediately
- (2) Cover sneeze and cough - turn away
  - (a) Avoid intimate contact with others
- (3) Do not expectorate on floor, etc.
- (4) Maintain rigid personal hygiene

c. Proper housing

- (1) Bed spacing in barracks or pyramidal tent
  - (a) Minimum space
  - (b) Means of increasing space
    - (1) Head to foot sleeping
    - (2) Staggering
    - (3) Cubicle construction
- (2) Ventilation
  - (a) Correct temperature
  - (b) Correct humidity
  - (c) Proper method of opening windows

1. How to avoid drafts

- (3) Cleaning
  - (a) Mopping floor daily, or
  - (b) Sweeping with dust holder

1. Salt, moist sawdust, rice water, sweeping compound

- (c) Scrub floor once a week

- (d) Air bedding twice a week
- (e) Furl or strike tents once a week
- (f) Roll wall whenever possible

d. Mess Sanitation

- (1) Dishes and utensils should be clean.

- (a) Warm soapy water, rinse in clear water, steam, and dry.
- (b) Kitchen tables and mess halls, etc. should be cleaned.
- (c) Dispose of wastes properly after each meal.
- (d) Examine food handlers.

4. Show FS 8-63 and stress:

- a. Methods of transmission
- b. Methods of control

Seventh Period - Two Hours  
Intestinal Diseases

Place: Classroom

References: TM 8-220, par 233; TM 8-229, pars 233-250; TB Med 114, 138; Military Preventive Medicine - Dunham; Preventive Medicine - Rosenau

Instructional Aids:

Personnel: Lecturer; projectionist

Equipment: Blackboard; TF 8-999 (16 min); TF 8-1179 (18 min); movie projector; screen

Individual Equipment: Notebook and pencil

10th & 11th Hours - Lecture, Demonstration

Points to be Covered:

1. Introduction

a. Intestinal diseases are of the utmost importance to the Army since their presence means a high non-effective rate. They also are most likely to crop up when sanitation measures are weakened as, for example, in the field of operations where greater vigilance is required to prevent flareups.

b. No other group of diseases with which medical science, by

the application of a few simple measures, has obtained such marked success in controlling.

## 2. Definition of intestinal diseases:

a. Those diseases which are transmitted from person to person by organisms which have been eliminated in the urine or feces or both.

### b. List of intestinal diseases:

- (1) Typhoid Fever
- (2) Paratyphoid Fever
- (3) Amebic Dysentery
- (4) Bacillary Dysentery
- (5) Cholera
- (6) Undulant Fever
- (7) Worm Infestations
- (8) Food Poisonings

## 3. Control of intestinal diseases:

### a. Sources of infection and control:

- (1) Case - Briefly cover isolation technique, stress disinfection of urine and feces.
- (2) Carrier - 4-5% of typhoid patients continue to excrete bacteria for a year to indefinitely.
  - (a) Tell story of "Typhoid Mary."
  - (b) Stress education of the carrier in matter of personal hygiene.

### b. Transmitting agencies and control:

#### (1) Water

- (a) Protect water by proper disposal of waste.
- (b) Purification of water.
- (c) Protection of purified water.
- (d) Tell story of typhoid epidemic of Plymouth, Pennsylvania.
- (e) Show film on military sanitation (TF 8-1179).

#### (2) Food

- (a) Supervise the sanitary condition under which food is produced, transported, and stored.
- (b) Inspection of food prior to use.
- (c) Meat inspection.

- (d) Pasteurization of milk.
- (e) Sanitation of kitchen.
- (f) Cleanliness of food handlers.
- (g) Physical examination of food handlers.

(3) Flies

- (a) Control of breeding places.
- (b) Kill adult flies.
- (c) Protect food from flies.
- (d) Show TF 8-999 (The Fly)

(4) Hands

- (a) Personal cleanliness, proper disposal of excretions.

Eighth Period - One Hour  
Typhoid Fever and Cholera

Place: Classroom

References: TM 8-220; TM 8-229; Military Preventive Medicine - Dunham; Preventive Medicine - Rosenau; TB Med 114, 138

Instructional Aids:

Personnel: Lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

12th Hour - Lecture

Points to be Covered:

1. Introduction

a. Typhoid Fever and Cholera are of extreme military importance since they exist in many of the places where troops are stationed, and because one of the major factors in their spread is by water which is so necessary for human survival.

2. Typhoid Fever

a. Stress military importance of such an intestinal disease.  
b. Definition:

(1) A communicable intestinal disease caused by the typhoid bacillus characterized by a continued high fever, slow pulse, rose colored eruption, prostration, and enlargement of the spleen.

c. Etiology and pathology

(1) Rapidly trace the course of the disease showing how it reaches the intestine and may cause hemorrhage or perforation.

(2) Show how some people; i.e. 4-5%, remain carriers.

d. Diagnosis

(1) Signs and symptoms: step like rise in temperature, rose spots, slow pulse.

(2) Laboratory tests:

- (a) Leucopenia
- (b) Widal test
- (c) Blood culture - first 10 days
- (d) Urine and stool culture after first 10 days

e. Prognosis

(1) Death rate 15-20%

f. Control

(1) Review methods of control

- (a) Case
- (b) Carriers
- (c) Food
- (d) Water
- (e) Flies
- (f) Hands
- (g) Vaccination - 3 injections - booster once a year

1. Point of examples of efficacy of this vaccine; record of San Antonio.

(h) Personal measures

g. Treatment: fluids, adequate feeding, treat hemorrhage, streptomycin looks promising.

3. Cholera

- a. Definition: a communicable intestinal disease.
- b. Incidence and importance
  - (1) Home in the China-Burma-India Theater.
  - (2) Scarcely a country in world has not been affected.
  - (3) 1904-1923 in India over 7,000,000 deaths.
  - (4) In the civil war more died of cholera than of wounds.
  - (5) Tell story of cholera epidemic of Hamburg, 1892.
  - (6) Tell about quarantine authorities in 1912 examining 34,000 stools and finding 27 carriers and 28 diseased.
- c. Sources and transmitting agencies similar to typhoid.
- d. Pathology course: briefly explain the rice water stool, outpouring of water, and parenchymal nephritis.
- e. Diagnosis
  - (1) Symptoms and signs: diffuse, watery stool with mucoid specks; vomiting.
  - (2) Laboratory tests:
    - (a) Stool examination - smear
    - (b) Agglutination test - vibrios cultured and agglutinated
- f. Control
  - (1) Similar to typhoid
  - (2) Mention Haffkine vaccine
- g. Treatment: intravenous fluids.

Ninth Period - Two Hours  
Dysenteries and Diarrheas

Place: Classroom

References: TM 8-220; TB Mod 159, 119, 114; Military Preventive Medicine - Dunham; Preventive Medicine - Rosenau

Instructional Aids:

Personnel: Lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

13th & 14th Hours - Lecture

Points to be Covered:

## 1. Introduction

a. The diarrheas and dysenteries are two of the most important groups of intestinal diseases because of their wide distribution and high ineffective rate when present.

## 2. Explanation

## a. Amebic Dysentery:

(1) Definition: A communicable intestinal disease caused by endamoeba histolytica. (Stress blood and mucus in stool.)

(2) Incidence and importance:

- (a) Most common in tropics and subtropics
- (b) World wide in distribution
- (c) 5% of people are infested
- (d) Tell story of Chicago epidemic in 1933
- (e) Tell story of Texas Guinan

(3) Course of disease and pathology:

- (a) Formation of ulcers of large intestine
- (b) Possible liver abscess
- (c) Explanation of symptoms

(4) Diagnosis

(a) Symptoms and signs

- 1. Acute case: gradual onset, diarrhea, quite painless
- 2. Chronic case: bouts of diarrhea, vague abdominal complaints
- 3. Carrier: may be none

(b) Laboratory tests

- 1. Sigmoidoscopic examination
- 2. Stool examination

(5) Prognosis and treatment

(a) Emetine HCL

(6) Control: same as typhoid fever

b. Bacillary Dysentery

- (1) Definition: stress blood, mucus and pus in stool.
- (2) Incidence and importance:
  - (a) Prominent in tropics and subtropics.
  - (b) Epidemics are world wide.
  - (c) In all armies up to recent times it has killed more soldiers than bullets.
  - (d) Called famine, ship, camp, asylum, and jail dysentery, for it accompanies:
    1. Overcrowding
    2. Uncleanliness
    3. Unhygienic measures
- (3) Pathology
  - (a) Inflammation of bowel
  - (b) Toxemia
- (4) Diagnosis
  - (a) Symptoms and signs: cramps, diarrhea, bloody stools.
  - (b) Culture of bacilli from stool.
- (5) Control: similar to typhoid fever
- (6) Treatment: Sulfadiazine, sulfasuccidine, intravenous fluids, antitoxin, low residue diet.

c. Food Poisonings

- (1) When to suspect food poisoning:
  - (a) Several people or more become acutely ill with abdominal pain, nausea, vomiting, and diarrhea,
  - (b) After having partaken of a meal together.
- (2) Important points in investigation of break:
  - (a) True story - early
  - (b) Obtain samples of food, vomitus, blood
- (3) Why doesn't every one that has partaken of the food become ill?
  - (a) Amount of food eaten
  - (b) Resistance of individual
- (4) Discuss "Ptyaline Poisoning"

- (a) Discuss limburger cheese, steaks, and pleasantries.
- (b) Discredit the term.
- (c) Tell story of dead whale and explorers (Rosenau - Preventive Medicine)

(5) Causes of food poisoning:

- (a) Bacteria

1. Toxin of staphylococcus

- a. Importance (foremost cause)
- b. Transmission agents: those with staphylococcus infections
- c. Pathology: due to toxin
- d. Characteristics of toxin: colorless, odorless, tasteless; not affected by boiling
- e. Signs and symptoms: incubation period 2-3 hours; sudden intense diarrhea; abdominal cramps; vomiting
- f. Prognosis: recovery
- g. Food frequently involved: cream pastries and foods
- h. Prevention: eliminate diseased food handlers; protect food from exposure; foods apt to be involved should not be prepared more than four hours ahead of time; refrigerate foods until served.

2. Toxin Botulinis (Botulism)

- a. Definition: Acute specific intoxication due to neurotoxin produced by clostridium botulinum.
- b. Incidence: Improperly prepared food - home canned.
- c. Characteristics of toxin: Destroyed by boiling for 45 minutes; colorless, odorless, and tasteless.
- d. Signs and symptoms: Disturbance of vision, weakness, paralysis.
- e. Prognosis: 2/3 of people die.
- f. Prevention: Proper canning and preserving; boil canned foods 15 minutes.

3. Salmmella Food Poisoning

- a. Incidence and importance: Meat and meat products; pastries.
- b. Signs and symptoms: Nausea, vomiting, diarrhea, abdominal pain.

- c. Prognosis: Good.
- d. Prevention: Protection of foods from rats and mice; refrigeration.

- 4. Streptococcal and other bacterial poisonings - rare.

(b) Plant and Animal Poisonings

- 1. Certain fish
- 2. Shell fish
- 3. Fava bean
- 4. Ergot
- 5. Mushrooms - drug called "Muscarine"

(c) Chemical

- 1. Antimony
- 2. Cadmium cyanide
- 3. Sodium
- 4. Sodium fluoride
- 5. Zinc
- 6. D.D.T.

Tenth Period - Two Hours  
Malaria and Dengue

Place: Classroom

References: TM 8-220; TB Med 72, 14, 42, 65, 164; Military Preventive Medicine - Dunham; Preventive Medicine - Rosenau

Instructional Aids:

Personnel: Lecturer; projectionist

Equipment: Blackboard and chalk; Misc 1035 (5 min); Misc 157 (10 min); movie projector and screen.

Individual Equipment: Notebook and pencil

15th & 16th Hours - Lecture

Points to be Covered:

1. Introduction

a. Malaria and Dengue are two mosquito borne diseases which you will meet in tropic and subtropic countries. These diseases will get you if you do not know how to protect yourself.

## 2. Explanation

## a. Mosquito

- (1) Show Misc 157 (Mosquito - Winged Scourge)
- (2) Life cycle of mosquito - requires 1-2 weeks

- (a) Egg stage
- (b) Larval stage

1. Require oxygen and food

- (c) Pupal stage

1. Require oxygen and food

- (d) Adult stage

1. Distinguishing features of:

- a. Anopheles: Feeds or rests at an angle; others are parallel.
- b. Male mosquitoes feed on plants; female requires blood meal.

2. Time when they bite:

- a. Anopheles and culex bite from dusk to dawn.
- b. Aedes bites during day.

3. Flight range

4. Breeding places

## 3. Malaria

## a. History

- (1) Derivation from the Italian "mala" bad and "aria" air.
- (2) Fall of Roman Empire due to malaria.
- (3) Cinchona - Jesuits cured Countess Cinchona.
- (4) Discovery of plasmodium in 1880.
- (5) Final proof of mosquito malaria cycle in 1900.

## b. Incidence

- (1) Prominent in tropic and subtropic countries.
- (2) Southern United States contains endemic areas.
- (3) Incidence likely to increase following the return home of soldiers.

c. Definition of disease

(1) A communicable disease caused by the plasmodia of malaria and transmitted from man to man by the mosquito.

d. Course of disease

(1) Trace the cycle, etc.

(a) In mosquito:

1. Mosquito ingests gametocytes (sexual form)
2. Sexual union occurs producing zygotes at moment of union.
3. Zygote becomes oocyte which lodges in wall of stomach of mosquito.
4. Oocytes develop into sporocysts in wall of stomach.
5. Sporocysts rupture into blood stream of mosquito and are carried by the blood to the salivary glands from where they are injected into man when mosquito bites.

(b) In man:

1. Mosquito bites man and injects sporocysts which enter red blood cells in blood stream of man.
2. Two stages of development in man:
  - a. Schizonts or splitting form.
  - b. Merocytes
3. Certain merocytes produce sexual form or gametocytes which will again infect mosquito when it bites man.

e. Diagnosis

(1) Signs and symptoms

- (a) Chill, fever, sweats
- (b) Sometimes atypical symptoms

(2) Blood smears

f. Prognosis

- (1) Death rate less than 1%
- (2) Possibility of relapses

## g. Suppressive therapy (medications taken as preventive)

- (1) Delays onset of symptoms
- (2) Does not prevent infection
- (3) Important to continue anti-malarial measures to prevent development of disease.

## h. Treatment

- (1) Quinine, Atabrine, Plasmochin

## i. Control - Show TF 1035

## j. Personal protective measures

- (1) Bed nets
- (2) Protective clothing
- (3) Chemical repellents
- (4) Suppressive medication; atabrine merely prevents appearance of symptoms
- (5) Avoid unnecessary exposure

## k. Environmental measures

- (1) Proper selection of camp site
- (2) Mosquito-proof buildings
- (3) Destroy adult mosquitoes
- (4) Control breeding

- (a) Drainage
- (b) Fill in depressions
- (c) Stream clearance
- (d) Fluctuate water level
- (e) Kill larvae

## l. Oil, D.D.T., Paris green, fish

## 4. Dengue

## a. Prevalence

- (1) Tropic and subtropic countries and U. S.

- (a) Epidemics in Texas

## b. Definition

- (1) An infectious, eruptive, febrile disease coming on suddenly and marked by severe pains in the head, eyes, muscles and joints, rose throat, catarrhal symptoms and sometimes a cutaneous eruption

c. Course of disease

- (1) Signs and symptoms: as in "b" above.
- (2) The disease comes on suddenly after an incubation period of 3-6 days. The symptoms increase in severity for two or three days and then decrease somewhat only to increase again on the fourth or fifth day, at which time the symptoms appear again.. The severity of the fever and the severity of the symptoms correlate. The disease is very demoralizing and convalescence takes a long time often accompanied by a state of mental depression

d. Control: similar to that for malaria.

Eleventh Period - One Hour  
Other Insect Borne Diseases

Place: Classroom

References: TM 8-220; TB Med 31, 114; Military Preventive Medicine - Dunham; Preventive Medicine - Rosenau

Instructional Aids:

Personnel: Lecturer; projectionist

Equipment: Blackboard and chalk; movie projector; screen; TF 8-1467 (17 min)

Individual Equipment: Notebook and pencil

17th Hour - Lecture

Points to be Covered:

1. Introduction

a. There is one very important class of insect borne diseases, the most important of which becomes most prominent and most dangerous during wars and just afterward due to the disruption of normal sanitation and personal hygiene. The group is the Rickettsial diseases and of these Typhus is the most feared.

2. Explanation - Rickettsia

a. Description: small bacterium-like organisms which live in the cells of lice, ticks, mites, and other arthropods.

b. Five main diseases transmitted

- (1) Epidemic or European Typhus Fever
- (2) Endemic or Murine Typhus Fever
- (3) Scrub Typhus
- (4) Rocky Mountain Spotted Fever
- (5) Trench Fever

3. Epidemic Typhus

a. History

- (1) Occurs in time of war, famine, poverty, etc.
- (2) One of great epidemic diseases of world.
- (3) Epidemics after last world war and during this world war.

b. Incidence: Asia, Africa, Southwest Pacific, Europe, British Isles, Alaska, Central and South America.

c. Definition: Caused by Rickettsia Prowazekii.

d. Signs and symptoms: Headache, backache, dizzy, temperature to 104-105, rash, stupor.

e. Prognosis: Fair if no complications.

f. Control: Bound up in control of the louse.

- (1) Description of louse: 6 legs, flat, white, 1/6" long, claws.
- (2) Types of lice
  - (a) Head louse
  - (b) Body louse - most important in transmission of typhus
  - (c) Pubic louse
- (3) Life cycle of louse
  - (a) Egg to adult requires about three weeks.
  - (b) Eggs hatch at end of nine days and require a blood meal by end of 24 hours.
- (4) Breeding places and methods of transmission
  - (a) Directly from person to person by close contact.
  - (b) Indirectly.
- (5) Control

- (a) Body cleanliness, frequent bathing, and changing of clothing.
- (b) Insecticide powders, especially DDT.
  - 1. 24 hours exposure necessary.
  - 2. Repeat after 10 days.
- (c) Storage of clothing
- (d) Exposure to 10° for two hours
- (e) Heat E.G. Serbian Barrel
- (f) Insecticide Liquids
- (g) Vaccine for epidemic typhus is only an adjunct to louse control.

(6) Show TF 8-1467 (Control of Louse Borne Diseases).

Twelfth Period - Two Hours  
Water: Purification and Water Discipline

Place: Classroom and Sanitary Area

References: TM 8-220, par 252; Military Preventive Medicine - Dunham; TM 21-10, Ch 3

Instructional Aids:

Personnel: One officer; one enlisted instructor per 7 students; projectionist

Equipment: Blackboard and chalk; lyster bags; canteen and cup; calcium hypochlorite; orthotolidine test set; movie projector and screen; FB-99 (17 min); TF 8-1174 (18 min).

Individual Equipment: Notebook and pencil, canteen and cup.

18th & 19th Hours - Lecture, Demonstration, Application

Points to be Covered:

1. Introduction

a. Brief review of the common water-borne diseases and the part that proper treatment of water supply has in their control.

2. Explanation

a. Military importance of pure supply of water.

b. Responsibility for water supply in the field.

- (1) Corps of Engineers
- (2) Medical Department
- (3) Unit Commander

c. Quantity requirements of water in military field installations.

- (1) In combat - one (1) gallon per man per day
- (2) On march or bivouac - three (3) gallons per man per day
- (3) In temporary camps - five (5) to twenty-five (25) gallons per man per day

d. Quality requirements for water.

(1) Definition of potable water, contaminated water, polluted water.

(a) Potable water: One which is free from disease producing organisms and injurious chemicals. It does not have obnoxious tastes or odors, and is not turbid or colored to a degree which renders it objectionable for domestic use.

(b) Contaminated water: Water which contains disease producing organisms.

(c) Polluted water: Water containing human or animal wastes.

(2) Water safety

(a) Disease factors

1. Human excreta contains large numbers of bacteria of the coliform group. The presence of these bacteria in water is evidence of fecal pollution and therefore indicates the probable presence of disease producing organisms of such diseases as Typhoid Fever, Bacillary and Amebic Dysentery and Cholera.

(b) General quality factors

1. The attractiveness and palatability of water are determined by such physical and chemical characteristics as:

- a. Taste
- b. Color
- c. Turbidity
- d. Odor

- e. Chlorine consuming properties
- f. Mineral characteristics

e. Sources and selection

(1) Selection factors

- (a) The availability and accessibility of adequate sources.
- (b) Relative safety and general quality of the accessible adequate supply.
- (c) Procurement, treatment, storage, and distribution facilities.

(2) Five sources of water

- (a) Surface
- (b) Ground
- (c) Rain
- (d) Snow and ice
- (e) Sea water

f. Water treatment

- (1) Objective: To provide a safe, attractive, and palatable water supply.
- (2) Methods of water treatment:

- (a) Filtration
- (b) Chemical treatment
  - 1. Water sterilizing bag method
  - 2. Individual canteen method
  - 3. Five gallon water can method
  - 4. Halazone tablet method
  - 5. Distillation
  - 6. Boiling

g. Water Discipline: Good water discipline in any unit is evidenced by the following:

- (1) Water is consumed only from authorized sources.
- (2) Water equipment is kept clean and in good repair.
- (3) All necessary measures are taken to prevent pollution of water.
- (4) No avoidable waste of water occurs.
- (5) In combat, on the march and during other vigorous exercise, men do not consume excessive quantities of drinking water.

### 3. Demonstration

a. Instructur demonstrates chemical purification of water, using the water sterilizing bag, and the individual canteen methods, and the use of the orthotolidine testing set.

b. TF 8-1174 (Purification of Water); FB-99 (Field Water Supplies).

### 4. Application

a. Students using individual canteen method will purify samples of water and test as demonstrated.

b. Students using lyster bag will purify samples of water and test as demonstrated.

## Thirteenth Period - Two Hours Waste Disposal

Place: Classroom and Sanitary Area

References: TM 8-220, pars 253 and 233; TM 21-10, Ch 4

Instructional Aids:

Personnel: One officer; one enlisted instructor per 7 students.

Equipment: Blackboard and chalk; FS 8-60; film strip projector; sanitary area with models.

Individual Equipment: Notebook and pencil

20th & 21st Hours - Lecture, Demonstration

### Points to be Covered:

#### 1. Introduction

a. Two types of wastes are:

- (1) Human
- (2) Kitchen

b. Relation of wastes to disease.

#### 2. Explanation

a. Proper disposal of human wastes in the field.

- (1) Latrines - must handle 8% of the command.

- (a) Are maintained by the company.
- (b) Two linear feet per man,
- (c) Must be flyproof
- (d) Must not extend in depth to water level.
- (e) Hard ground is unsatisfactory.
- (f) Must be at least 100 yards from mess installations and water supply.

(2) Types of latrines

- (a) "Cat Hole"
- (b) Shallow trench (straddle trench)
- (c) Deep pit using standard QM box
- (d) Pail type using standard QM box

b. Kitchen wastes (garbage)

(1) Types of garbage

- (a) Solid
- (b) Liquid
- (c) Must be separated

(2) Methods of garbage disposal

- (a) Burial
- (b) Incineration
- (c) Sell or give away

(3) Incineration methods

- (a) Cross trench and barrel
- (b) Inclined plane type incinerator
- (c) Rock pit incinerator

(4) Disposal of liquid garbage

- (a) Soakage pit
- (b) Soakage trench
- (c) Evaporation beds

(5) Removal of grease from liquid garbage

- (a) Filter grease traps
- (b) Baffle grease traps

3. Demonstration

a. FS 8-60 (Waste Disposal)

b. TF 8-1179 (Military Sanitation)

c. Models of various types of latrines, urine soakage pits, garbage incinerators, garbage separators, and garbage soakage pits, in the sanitary area, will be demonstrated and explained to students by the instructor.

Fourteenth Period - Three Hours  
Venereal Diseases

Place: Classroom

References: TM 8-220, par 263; TB Med 106, 96; Military Preventive Medicine - Dunham; Preventive Medicine - Rosenau.

Instructional Aids:

Personnel: Lecturer; projectionist

Equipment: Blackboard and chalk; charts of genital organs of male and female; TF 8-1423 (21 min); movie projector and screen.

Individual Equipment: Notebook and pencil

22nd, 23rd, & 24th Hours - Lecture

Points to be Covered:

1. Introduction

a. Five venereal diseases

- (1) Cause suffering and tragedy.
- (2) 60% of all males contract gonorrhea some time during life.
- (3) 700,000 new infections occur yearly.

2. Syphilis

a. History

- (1) Sailors of Columbus and spread over Europe.
- (2) Poem "Syphilis" by Fracastoras.
- (3) Naming the disease.
- (4) Story of invention of darkfield examination.
- (5) Wasserman's discovery of the serology test.

b. Etiology

- (1) Brief description of spirocheta pallidum

c. Mode of transmission

(1) Direct intimate contact

- (a) 90% genital lesion
- (b) 10% extra-genital

d. Stages of disease

(1) Early

(a) Primary stage - or chancre

1. Incubation period.
2. Trace course of this stage.
3. Description of various lesions.
4. Diagnosis of "darkfield".
5. Wasserman positive in only 40-60% of cases (14 days to become positive).
6. Stress fact that within several hours the spirochete has traveled through the body.
7. Early prophylactic measures are necessary.

(b) Secondary stage

1. Description of the manifestations.
2. Diagnosis by Darkfield and Seriology.
3. Stress fact that early syphilis is highly infectious, but individuals are not incapacitated.

(2) Late stage

- (a) Time interval
- (b) Description of manifestations
- (c) Diagnosis

1. Serology

3. Gonorrhea

a. Definition: An acute infectious disease caused by the gonococcus.

b. Incidence

(1) 700,000 new cases per year

c. Etiology

- (1) Sexual intercourse
- (2) Describe organism and its characteristics

d. Course of disease - utilizing charts

- (1) Trace route of infection, explaining:

- (a) Signs and symptoms
- (b) Progress of infection
- (c) Destruction of tissues causing:

- 1. Urinary obstruction
- 2. Sterility
- 3. Operation
- 4. Ophthalmia Neonatorum

2. Crede's prophylactic

- (d) Foci of residual infection
- (e) Diagnosis

- 1. Signs and symptoms
- 2. Smear of discharge

4. Chancroid

a. Definition: A specific infectious disease caused by Ducrey's bacillus, manifested by characteristic ulceration, usually on the genitals.

b. Course

- (1) Incubation period
- (2) Trace route of infection
- (3) Resultant disease

c. Diagnosis

- (1) Signs and symptoms
- (2) Smear of exudate

5. Lymphogranuloma Inguinale

a. Definition: Subacute infectious disease characterized by a primary herpetiform ulcer on the external genitalia followed by unilateral or bilateral involvement of the inguinal gland, fever, anorexia, and prostration.

b. Incidence and prevalence

c. Course of disease

d. Diagnosis

- (1) Frei test

6. Granuloma Inguinale

a. General description of disease: An infectious disease characterized by granulomatous ulcerations involving most commonly the inguinal regions, genitals, thighs, perineum, and anus.

7. Treatment of Venereal Diseases

a. Syphilis

- (1) Penicillin
- (2) Hg, As, Bi
- (3) Malarial therapy, fever therapy (for late nervous system syphilis)

b. Gonorrhea

- (1) Penicillin
- (2) Sulfa

c. Chancroid

- (1) Sulfa
- (2) Cleanliness - antiseptics

d. Lymphogranuloma Inguinale

- (1) Sulfa

e. Granuloma Inguinale - Fuadin

8. Control of Venereal Diseases

a. Importance of education and information

- (1) Dispel false rumors; e.g. of glands drying up
- (2) Allocate energies on other fields
- (3) Suppress prostitution
- (4) Prophylactics
  - (a) Mechanical - describe proper use
  - (b) Chemical - description
  - (c) Stress importance of treatment in the first hour after exposure.
  - (d) Stress continence

9. Show TF 8-1423

Fifteenth Period - One Hour  
Tropical Warfare

Place: Classroom

References: FM 8-45; FM 31-20; FM 8-40; FM 21-10

Instructional Aids:

Personnel: Lecturer; projectionist

Equipment: Blackboard and chalk; movie projector and screen;  
TF 1-3347 (show only 30 min of this film)

Individual Equipment: Notebook and pencil

25th Hour - Lecture, Demonstration

Points to be Covered:

1. Introduction

a. Conditions in the tropics such as large numbers of various types of insects, high temperature, high water tables, constant rainfall, enteric and skin diseases create many difficult problems with reference to handling of food and the maintenance of health.

2. Explanation

a. High physical standards:

(1) In jungle warfare the soldier fights two enemies: man and nature, and of the two, nature is often the more formidable. The jungle task force, including attached medical troops (Battalion Medical Sections, etc.), should be selected as to physical fitness and must be composed of very young men who are able to withstand the hardships of this peculiarly exhausting type of service.

b. Special training for jungle warfare:

(1) Acclimatization is very important for all the force, including attached medical troops. Six to eight weeks are considered necessary to acclimatize troops to the increased temperatures, the rains, humidity, and the mud of the tropics.

c. Care of areas in which troops are quartered:

(1) The tropics are infested with insects of various types. Each type contributes its share in causing illness or death. Rats are also numerous on the islands of the Pacific and since they act as carriers of the deadly bubonic plague, great emphasis must be placed on the necessity for their extermination. Areas should be kept free of all insects and rodents by:

- (a) Keeping ground clear of all weeds and the grass cut short.
- (b) Burning or spraying the area.
- (c) Keep food covered at all times.
- (d) Not allowing dirty and sweaty clothes to collect and lie around.
- (e) Keeping animals out of the area.
- (f) Proper covering and disposal of garbage.
- (g) Trap and poison rats.

d. High water tables:

(1) Water tables have been found at a level of not more than six inches below the surface. This fact will present many difficult problems to be overcome if conditions demand that such an area be used. It will be necessary to:

- (a) Construct duck-board walks.
- (b) Raise the floors of all tents.
- (c) Install a good drainage system.
- (d) Construct latrines on top of the ground.

e. Food:

(1) Because of the consumption of raw or partly cooked meat and fish, gastro-intestinal diseases are very common, especially tapeworm infections. Infection of the natives runs from about 1/3 to 1/2 of the population.

(2) As all agricultural and fish products are likely to be contaminated or infected with parasites, the following measures are recommended:

- (a) Avoid local food supply except in case of emergency.
- (b) Avoid native prepared foods.
- (c) All locally obtained foods must be thoroughly cooked.
- (d) Unpeelable fruits and leafy vegetables should be immersed for at least one minute in boiling water before serving.

3. Demonstration

a. Show TF 1-3347 (Land and Live in the Jungle)

Sixteenth Period - One Hour  
Personality Disorders

Place: Classroom

References: None

Instructional Aids:

Personnel: Lecturer; projectionist.

Equipment: FB 184 (47 min); movie projector and screen

Individual Equipment: None

26th Hour - Demonstration

Points to be Covered:

1. Introduce FB 184.
2. Show FB 184.

Seventeenth Period - Two Hours  
Chemical Warfare

Place: Classroom

References: FM 21-11; TM 8-285

Instructional Aids:

Personnel: Lecturer; projectionist

Equipment: Blackboard and chalk; movie projector; TF 3-2016 (28 min); TF 8-1180 (24 min); TF 3-1407 (16 min)

Individual Equipment: Notebook and pencil

27th & 28th Hours - Lecture

Points to be Covered:

1. Introduction
  - a. Objective of training in defense against chemical warfare.
  - b. Definition of chemical agent.
  - c. Gas discipline.

## 2. Explanation

### a. Classification of chemical agents:

#### (1) According to physical state:

- (a) Gases: chlorine, phosgene
- (b) Liquids: mustard, lewisite
- (c) Solids: Adamsite, chloracetophenone

#### (2) According to tactical uses:

- (a) Direct casualty agents
- (b) Harassing agents
- (c) Screening agents
- (d) Incendiary agents

#### (3) According to physiological effects produced on personnel:

- (a) Lung irritants
- (b) Sternutators
- (c) Lacrimators
- (d) Vesicants
- (e) Nervous system poisons
- (f) Asphyxiating agents

#### (4) According to persistency:

- (a) Persistent chemical agents: Those which maintain an effective vapor concentration in the air at the point of release for more than ten minutes.
- (b) Non-persistent chemical agents: Those whose effectiveness is less than ten minutes.

### b. Tactical reasons for using chemical agents in warfare:

- (1) For disabling effect: To disable personnel, reduce their fighting efficiency, create panic, and reduce morale.
- (2) For interdictory effect: To interdict areas to occupation or passage of troops.
- (3) For destructive effect: To damage or destroy material; contaminate foods; road, equipment, and delay repairs.
- (4) For screening effect: Smoke agents to screen operations and to blind.

### 3. Demonstration

- a. TF 8-1180 (First Aid for Chemical Casualties)
- b. TF 3-2016 (Individual Protection Against Chemical Attack)
- c. TF 3-1407 (Decontamination Procedures, Part I, Basic Techniques)

Eighteenth Period - One Hour  
Tropical Warfare - Medical Consideration

Place: Classroom

References: FM 31-20

Instructional Aids:

Personnel: Lecturer; projectionist

Equipment: Blackboard and chalk; movie projector and screen; TF 8-2057 (15 min); TB 147 (20 min)

Individual Equipment: Notebook and pencil

29th Hour - Lecture

Points to be Covered:

1. Introduction

a. Malaria is prevalent in practically all tropical and sub-tropical countries of the world. It is rare at altitudes above 5000 feet.

b. Filariasis is wide spread throughout the tropical and sub-tropical regions of the world. Occurs in the West Indies, Central and South America, India, China, and the Pacific Islands.

c. Scrub Typhus Fever has a wide geographical distribution in the Asiatic-Pacific area.

d. Schistosomiasis occurs in the Far East, China, Formosa, Southern Philippine Islands, and Japan.

2. Explanation

a. Insect borne diseases of the tropics:

(1) Diseases transmitted by mosquitoes:

(a) Malaria - Anopheles mosquito

- (b) Yellow Fever - Aedes mosquito
- (c) Filariasis - Culex mosquito
- (d) Preventive measures:

- 1. Destroy adult mosquitoes.
- 2. Clean up and eliminate breeding places.
- 3. Protect individuals by use of repellents and netting for beds, screens for windows, head nets, and gloves.

(2) Diseases transmitted by mites and ticks:

- (a) Relapsing Fever
- (b) Scrub Typhus Fever
- (c) Preventive measures:

- 1. Frequent inspection of body and prompt removal of ticks.
- 2. Remove grass which harbors mites from camp areas.
- 3. Burn over the camp site.
- 4. Avoid sleeping on the ground.
- 5. Impregnate clothes with anti-mite fluids.

(3) Diseases transmitted by fleas:

- (a) Bubonic Plague
- (b) Endemic Typhus Fever
- (c) Preventive measures:

- 1. Eliminate rats, the host of fleas.
- 2. Store food properly.
- 3. Avoid native buildings.
- 4. Burn abandoned native huts and store houses.

b. Water borne diseases of the tropics:

(1) Schistosomiasis

- (a) Cause: Small flat worm found in pools and running streams, which in a matter of seconds burrows through the skin and infects the individual.

(b) Prevention and Control:

- 1. In suspected areas water should be boiled for drinking and bathing purposes.
- 2. Wading or swimming in infected areas should be avoided. If wading is unavoidable, long rubber boots should be worn.

3. Very important that there be disinfectant or other sanitary disposal of infected excreta. Special efforts must be made to prevent infected excreta from gaining access to the surrounding water supply.

3. Demonstration

- a. TF 8-2057 (Personal Health in the Jungle)
- b. FB 147 (Medical Service in the Jungle)

Nineteenth Period - One Hour  
Personal Hygiene Review

Place: Classroom

References: TM 8-220, Fars 246-247; FM 21-10, Ch 13; FM 70-15

Instructional Aids:

Personnel: Lecturer; projectionist

Equipment: Blackboard and chalk; film strip projector; FS 8-52; FS 8-53

Individual Equipment: Notebook and pencil

30th Hour - Lecture

Points to be Covered:

1. Introduction

a. Basic food requirements:

- (1) Carbohydrates
- (2) Proteins
- (3) Fats
- (4) Vitamins and minerals

b. Visible manifestations of any single vitamin deficiency are rarely seen.

c. A diet inadequate in one vitamin factor will usually be lacking in others.

2. Explanation

a. Vitamin A

(1) Some symptoms that may indicate a deficiency:

- (a) Eye membrane becomes rough, thick, and dull.
- (b) "Night Blindness."

(2) Sources of Vitamin A for Army diet:

- (a) Leafy green and yellow vegetables.
- (b) Meat, fish, and poultry, including liver.
- (c) Butter and dairy products.

b. Vitamin B1 (thiamin) called the nerve vitamin

(1) Symptoms that may indicate a deficiency:

- (a) Paralysis of parts of the body, such as the wrist.
- (b) Loss of appetite.
- (c) Decreasing efficiency

(2) Sources of Vitamin B1 in the Army diet:

- (a) Meat, fish, and poultry
  - 1. Especially lean pork products.
- (b) Grain products

c. Vitamin B2 (Riboflavin)

(1) Symptoms that may indicate a deficiency:

- (a) Cracks and soreness in corners of the mouth.
- (b) Itching and burning eyes.

(2) Sources of Vitamin B2 in the Army diet:

- (a) Milk and milk products from which butter and cream are excluded.
- (b) Meat, fish, and poultry
  - 1. Especially concentrated in the liver and other glandular meats.

d. Vitamin C (Ascorbic acid)

(1) Symptoms that indicate a deficiency:

- (a) The deficiency disease Scurvy.

(2) Sources of Vitamin C in the Army diet:

(a) Fresh or canned fruits.

1. Especially citrus fruits.

(b) Leafy green and yellow vegetables.

e. Niacin or Nicotinic Acid

(1) Symptoms that indicate a deficiency:

(a) The deficiency disease Pellagra with skin sores, diarrhea, and a feeling of depression.

(2) Sources of the vitamin Niacin in the Army diet:

(a) Meat, fish, and poultry group of foods.

(b) Grain products.

3. Demonstration

a. FS 8-52 (Good Food Habits)

b. FS 8-53 (Food for Health)



PERIOD	HOURS	WEEK	SUBJECT
1	1	5	Introduction
2	1	5	Stimulants
3	1	5	Cathartics
4	1	6	Penicillin
5	2	6	Sulfonamides
6	1	6	Streptomycin and Other New Preparations
7	2	6	Narcotics
8	1	6	Hypnotics
9	1	7	Sedatives
10	2	7	Anesthetics
11	1	8	Sulfonamides and Penicillin Review
12	1	8	Poisons
12	15		TOTAL

1. Purpose and Scope: The purpose of this course is to give the student the fundamentals of Materia Medica that may be helpful to him in caring for the sick and injured in an army hospital. The action and precautions of the most commonly used drugs will be emphasized so that the student will recognize normal reactions to those preparations and be alert for abnormal reactions. Army regulations regarding the storage and administration of the preparations discussed will also be emphasized. The course will include the following classes of drugs:

- a. Stimulants
- b. Cathartics
- c. Penicillin
- d. Sulfonamides
- e. Streptomycin and other new preparations
- f. Narcotics
- g. Hypnotics
- h. Sedatives

- i. Anesthetics
- j. Poisons

2. Standard of Proficiency: At the completion of the course each student should:

a. Be familiar with the names and uses of the more commonly used drugs.

b. Be able to recognize normal reactions to the more commonly used preparations and know what precautions to observe in each.

c. Be familiar with the rules and regulations governing the storage and administration of drugs used in an army hospital.

3. Basic References: "A Manual of Pharmacology," Sollman, 6th Edition; "Textbook of Materia Medica," Blumgarten, 7th Edition; "Materia Medica, Pharmacology, and Therapeutics," Wright and Mentag, 2d Edition.

First Period - One Hour  
Introduction

Place: Classroom

References: TM 8-233, Chapter I; "Manual of Pharmacology," Sollman, pp 1-57.

Instructional Aids:

Personnel: One man to act as lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

1st Hour - Lecture

Points to be Covered

#### 1. Introduction

a. Materia Medica is the study of the source, preparations, doses, uses, and effects of drugs or medicines.

b. The medical officer orders the drug to be given, the dose, the method of administration and the number of times it is to be given. The nurse usually gives the medication. The technician needs to be familiar with the common drugs used on army wards, so that he will be able to observe and report accurately the action of the drug, undesired effects, and if ordered to do so by the doctor or nurse be able to administer the medication.

## 2. Explanation

## a. Sources of Drugs:

## (1) Minerals

- (a) Acid
- (b) Alkalies
- (c) Salts of acids and alkalies

(2) Vegetables: drugs are obtained from the roots, the bark, the flowers, the fruit, or the sap.

## (3) Animals

## (a) Drugs made from organs:

- 1. Gland products
- 2. Products made from lining of stomach, etc.

(b) Preparation made from hormones eliminated by the body.

(4) Synthetic preparations are made by various chemical processes from other substances.

## b. Factors which influence the action and dosage of drugs:

- (1) Age - children and old people usually require smaller doses of medicine.
- (2) Size - The dose of a few medicines is determined according to body weight.
- (3) Tolerance is the ability to endure the use of a drug. Some patients require greater doses of a drug to get a specific effect. This may be due to individual or natural high resistance to the drug, or due to resistance acquired by continued use of the drug as in the case of alcoholics.
- (4) Idiosyncrasy - some people get unusual, opposite, or even poisonous effects from certain drugs.
- (5) Condition of patient - The dose may have to be increased if the symptoms are severe, whereas the dose may be decreased if the patient is in an extremely weak condition which lowers his tolerance for the drug.

## c. Classes of drugs - drugs are divided into classes or groups according to their action and will be studied in that manner.

(1) Stimulants - drugs which increase the function of an organ, system or body as a whole.

- (2) Sedative - drugs which lessen the activity of an organ. They are usually drugs which lessen nervous excitation.
- (3) Anesthetic - drugs which produce insensitivity to pain.
- (4) Analgesic - drugs which relieve pain
- (5) Hypnotics - drugs which produce sleep
- (6) Cathartics - drugs which cause movements of the bowels.
- (7) Specifics - drugs which cure specific diseases.

d. Forms in which drugs may be administered:

- (1) Liquid
  - (a) Solution in water
  - (b) Tincture - usually a 10% solution in alcohol.
  - (c) Syrup - drug in sugar solution.
  - (d) Elixir - drug in solution of alcohol, sugar, and oil.
  - (e) Fluid extract - concentrated solution
- (2) Solid
  - (a) Powder
  - (b) Pill or tablet - drug compressed or molded into solid form.
  - (c) Capsules - drug enclosed in gelatin container.

e. Routes of administration:

- (1) Mouth (orally) - most drugs are given this way, absorption takes place mainly in the small intestines.
- (2) Rectum - enemas, and suppositories. Absorption is slow.
- (3) Intravenous - into the vein
- (4) Hypodermic - under the skin
- (5) Intramuscular - into the muscle
- (6) Intradermal - between the layers of the skin
- (7) Inunction - rubbed into the skin
- (8) Inhalation - breathed in and absorbed through respiratory tract.

Training Notes:

1. Stress the fact that all medicines are ordered by a doctor.
2. Emphasize factors which may influence action and dosage of a drug.
3. Emphasize routes of administration of drugs.

Second Period - One Hour  
Stimulants

Place: Classroom

References: "A Manual of Pharmacology," T. Sollman, 6th Ed, pp 421-453.

Instructional Aids:

Personnel: One lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

2d Hour - Conference and Demonstration

Points to be Covered

1. Introduction:

a. Definition: A stimulant is a drug which increases the activity of the body, or any of its organs.

b. Drugs may produce stimulation by:

- (1) Acting on a center in the brain or spinal cord.
- (2) Acting on nerve endings.
- (3) Acting directly on tissue cells.
- (4) Acting upon glands which in turn give secretions which act on parts of the body.

2. Classification of stimulants as to the part of the body chiefly affected: It should be remembered that since many drugs act on more than one function or organ, certain drugs will appear under more than one heading.

a. Respiratory stimulants:

- (1) Used to treat any condition in which there is respiratory depression or failure.
- (2) Examples of respiratory stimulants

(a) Carbon dioxide

1. Action: Acts on the respiratory center in the brain which in turn causes the respirations to be deeper and more regular.

2. Administration: Carbon dioxide is given by inhalation in combination with oxygen. The strength may vary from 5 to 20% carbon dioxide in 95 to 80% oxygen.

(b) Coramine

1. Action: Acts as a respiratory stimulant in collapse.
2. Administration: It is usually given by hypodermic or intravenous injection. It may also be given by mouth.

(c) Others:

1. Atropine
2. Camphor
3. Ammonia
4. Metrazol

b. Cardiac stimulants:

- (1) Used to strengthen the heart beat, make it more regular, regulate the rate of the beat.
- (2) Examples:

(a) Digitalis

1. Action: Digitalis make the heart beat slower and stronger.
2. Administration: Preparations of digitalis may be given by mouth, by hypodermic or intramuscular injection.
3. Precaution: During administration of digitalis the pulse must be watched closely. If the rate falls below 60 or there is a sudden drop, the drug should be stopped at once and the doctor or nurse notified.

(b) Coramine

1. Action: Because of rapid action it is a good emergency drug. It strengthens the heart beat and stimulates respirations.
2. Administration: Usually given by hypodermic, intramuscular, or intravenous injection.

(c) Adrenalin

1. Action: Immediate reaction is a more rapid heart beat; later the heart beats slower and stronger.
2. Administration: Usually given by hypodermic, intramuscular, or intravenous injection.

(d) Others:

1. Caffeine
2. Metrazol
3. Atropine
4. Strychnine

c. Nervous System stimulants:

- (1) Uses: To increase the activity of the entire brain or only of certain areas to it; to increase the activity of receiving and responding to stimuli.
- (2) Examples:

(a) Caffeine

1. Action: Caffeine increases the activity of almost every system of the body. It makes the person more alert.
2. Administration: Caffeine may be given in the form of coffee by mouth or by rectum. The usual preparation for hypodermic use is Caffeine Sodium Bonzoate.

(b) Benzedrine:

1. Action: Increases mental alertness and motor activity to the point of restlessness. Diminishes fatigue, sleepiness and ill feeling.
2. Administration: may be given by mouth, or by hypodermic, intramuscular or intravenous injection. Benzedrine may also be taken in the form of nose drops or inhaled. Taken in this way it opens the nasal passageways by constricting the blood vessels and thus shrinking swollen mucous membrane by lessening the blood supply.
3. Precautions: Overdose or prolonged and indiscriminate use should be guarded against. Serious reaction may occur if a person is hypersensitive to the drug. Addiction and increasing blood pressure may also be caused.

(c) Strychnine:

1. Action: Makes reflexes more sensitive and so stimulates respiration and coughing. It is principally a general tonic but may be used in collapse.

2. **Administration:** Strychnine preparations may be given hypodermically when used in collapse or they may be given by mouth when used as a general tonic.

Training Notes:

1. Emphasize that many stimulants act on more than one part of the body.
2. Stress precautions mentioned for digitalis and benzedrine.
3. Emphasize that many more preparations may be used as stimulants but the action of all stimulants is the same, e.g., to increase the activity of the body or any of its organs.

Third Period - One Hour  
Cathartics

Place: Classroom

References: "Manual of Pharmacology," Sollman, pp 196-210, 367-389.

Instructional Aids:

Personnel: One man to act as lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

3rd Hour - Lecture

Points to be Covered

1. Introduction

a. Cathartics are drugs which produce a movement of the bowels. The type and dosage of the cathartic will be chosen by the doctor according to the effect he desires. The best time for giving a cathartic depends largely upon its mode of action.

2. Explanation

a. Mechanism of action -- increased peristalsis caused by:

- (1) Irritation of lining of intestine.
- (2) Increase in the bulk of the contents of the intestine.
  - (a) Substances which have a high degree of indigestible material such as cellulose, e.g. fruits, vegetables, bran.

- (b) Substances which take up water and swell such as agar.
- (c) Substances which prevent absorption of water such as mineral oil.
- (d) Substances which draw fluid into the intestinal tract such as Epsom salt.

b. Cathartics classified on the basis of their degree of action.

(1) Laxatives - medicines which cause a few movements of the bowels.

(a) Mineral oil - heavy, colorless, odorless, tasteless oil.

- 1. Action - is not absorbed by the body; prevents absorption of water, softens the feces and adds to the bulk.
- 2. Use: Used especially in chronic constipation.
- 3. Administration: Two to three hours after meals. Usually given at bedtime. Usual dose - 30cc or 1 oz.

(b) Cascara - prepared from the bark of California buckthorn.

- 1. Action: acts on the large intestines
- 2. Use: for habitual constipation
- 3. Administration:

- a. Extract of cascara - a brown pill
- b. Aromatic cascara - a brown concentrated liquid (frequently given with mineral oil)
- c. Others - as ordered by doctor on ward.

(2) Purgatives - drugs which produce frequent movements of the bowels, with soft stools accompanied by griping.

(a) Castor oil - obtained from the bean of a tree growing in warm climates. Unpleasant taste.

- 1. Action - irritates the intestinal wall to produce frequent soft stools.
- 2. Use - for complete evacuation mainly before special tests of G. I. tract.
- 3. Administration - usually given in fruit juices to disguise unpleasant taste. Usually given at bedtime.

(b) Saline cathartics - salts not readily absorbed in the intestines.

1. Action - Increase the amount of fluid in the intestine by withdrawing fluid from the tissues. Produces frequent watery stools.
2. Uses:
  - a. Reduces blood pressure and edema.
  - b. To obtain stool specimen for examination for parasite.
3. Administration - Magnesium sulfate (epsom salt) most commonly used. Given in solution of water and followed by large glass of water. Usually given in morning before breakfast.

(c) Others as may be ordered by doctor.

c. Rules for administration of cathartics:

- (1) Cathartics producing mild or slow effect should be given at night.
- (2) Cathartics which produce rapid effect should be given in the morning.
- (3) Cathartics should never be given immediately after meals they may cause vomiting.
- (4) Cathartics should never be given to undiagnosed abdominal cases.

Training Notes:

1. Stress the fact that cathartics are ordered only by a doctor.
2. Emphasize rules for administration of cathartics.
3. Stress danger of giving cathartic to patient with undiagnosed abdominal pain.

Fourth Period - One Hour  
Penicillin

Place: Classroom.

References: TB Med 112-1944

Instructional Aids:

Personnel: One man to act as lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

4th Hour - Lecture

Points to be Covered

1. Introduction:

a. Penicillin is a fairly new drug which has been found effective in the treatment of some types of infections. The technician will be taking care of patients receiving this drug and may be called upon to administer the medication.

2. Explanation:

a. Source - Penicillin is prepared from a type of mold. The pure drug is almost white in color but it is not usually received in pure form in the hospital. The color may vary from light yellow to brown due to the presence of other substances. Penicillin is stored in powder form and is put in solution for administration.

b. Use - research is still being done with penicillin, but at present it is being used in the treatment of infections caused by the streptococci, staphylococci, pneumococci, gonococci, and in the treatment of syphilis and gas gangrene.

c. Methods of Administration:

- (1) Intramuscular - most commonly used method.
- (2) Intravenous - more rapid action
- (3) By mouth - Occasionally given in a capsule which is not dissolved until it reaches the intestine. The capsule protects the drug from the juices of the stomach which destroy it. It may also be used as a troche or lozenge to hold in the mouth until it dissolves. This is for local effect on the mouth and throat.
- (4) Locally - wet dressing and irrigations.
- (5) Injected into infected cavities - joints, plural cavity, etc.
- (6) Inhalation for sinus and respiratory infections. The drug is vaporized by oxygen rather than heat.

d. Preparations - Measured in Oxford units.

- (1) Aqueous or saline preparations (commonly used type)
  - (a) Vacuum packed in small bottles containing 100,000 200,000 units in powder form.
  - (b) Put into solution by adding sterile distilled

water or normal saline. Usual strength 20,000 units per cc, but can be prepared in any strength. Procaine may be added by order of doctor. This is to prevent pain due to the injection.

- (c) Penicillin should be kept in a cool place and used within seven days after solution is prepared.
- (d) Excreted from the body in 3 to 4 hours.

(2) Penicillin in peanut oil and beeswax:

- (a) Not excreted for 24 hours.
- (b) Rarely used as it is difficult to give and may cause local abscesses.

e. Dose:

- (1) As ordered by the doctor - Usually 20,000 to 50,000 units every 3 hours day and night.
- (2) Varies with type of infection and condition of patient.

f. Penicillin Record - Required by the army because drug is scarce and expensive.

- (1) Record must be kept in units of all penicillin received by ward.
- (2) Record of all penicillin given to patient or lost. Must be signed by person responsible for administration or loss.
- (3) Record must be checked daily by nurse, three times a month by the ward officer, and monthly by the hospital inspector.

g. Toxic or poisonous reactions - The drug does not produce very poisonous effects. Skin rash and itching are the most common reaction. If toxic signs occur the drug is usually stopped, the patient given sedation and lotion is used for the itching.

Training Notes:

1. Emphasize that accurate record must be kept of all penicillin received and used on each ward.

2. Emphasize that penicillin is effective against specific organisms and cannot be used as a cure all.

**Fifth Period - Two Hours**  
Sulfonamidos

Place: Classroom

References: "A Manual of Pharmacology," Soliman, pp 638-640

Instructional Aids:

Personnel: One man to act as lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

5th and 6th Hours - LecturePoints to be covered1. Introduction:

a. The sulfa drugs are chemical compounds, discovered within the last ten years, which are used to treat certain infections. The use of sulfa drugs in the treatment of infections has completely changed the treatment and prognosis of many infectious diseases. The drugs are so widely used that all technicians will be caring for patients receiving sulfa therapy.

2. Explanation:

a. Action - The action of sulfa drugs is not clearly understood, it is thought that the drug slows down the growth and reproduction of the bacteria until the body can build up defenses to the germ.

- (1) The earlier the drug is used the more effective it will be.
- (2) Sulfa drugs are not effective against bacteria in localized collections of pus. The drug may, however, be given to prevent the spread of the infection.
- (3) A certain concentration of the drug is necessary before the drug is effective, hence the first two doses are usually larger to build up the desired concentration. Once the concentration is obtained the dose only needs to be sufficient to maintain the amount.
- (4) The drug is excreted by the kidneys. In an acid solution sulfa tends to form crystals. The urine may be acid and so form crystals. These crystals may cause kidney damage. To keep the urine alkaline so that sulfa crystals will not form, an equal amount of soda bicarbonate is usually given with the sulfa drugs.

b. Uses - Sulfa drugs are not effective in the treatment of all infections. They have been used in the treatment of infections caused by the streptococci, staphylococci, pneumococci, meningococci, gonococci, and others.

c. Administration:

- (1) Orally - This is the most common method. The drug is given in tablet form and usually accompanied by an equal amount of soda bicarbonate.
- (2) Intravenous - The sodium salt of the drug is usually used. More immediate action is obtained.
- (3) Ointments and Powders - 5 or 10% for skin infections, and wounds.
- (4) Solutions - eye drops, ear drops, etc.

d. Types of drugs:

- (1) Sulfanilamide - earliest compound used. Very effective against many infections but is most toxic of all sulfa drugs.
- (2) Sulfathiazole - effective against pneumococcus, streptococcus, meningococcus and gonococcus. Less toxic than sulfanilamide.
- (3) Sulfadiazine - effective against same bacteria. Less toxic than other sulfa drugs.
- (4) Sulfaguanadine and sulfasuxadine - occasionally used to treat diseases of the intestines. The drugs are not absorbed in the intestines.
- (5) Sulfapyradine and sulfamerazine - other sulfa preparations.

e. Toxic reactions:

(1) Mild symptoms:

- (a) Dizziness
- (b) Loss of appetite
- (c) Nausea and vomiting
- (d) General malaise
- (e) Cyanosis (especially with sulfanilamide)

(2) More dangerous symptoms:

- (a) Rash
- (b) Swelling of eyelids
- (c) Continued vomiting
- (d) Increase in temperature
- (e) Blood in urine
- (f) Anemia

f. Nursing care of patients receiving sulfa drugs.

- (1) Give and chart medication as ordered.
- (2) Force fluids. The danger of complications caused by crystals in the urine makes it necessary that the patient receive a minimum of 1500 cc of fluid per day. The doctor may order fluids forced to as much as 3000 cc or 4000 cc per day. This fluid serves

to dilute the urine and cause more rapid elimination from the kidneys.

- (3) Keep accurate record of intake and output, if ordered.
- (4) Observe and report signs of toxic reaction.

g. Laboratory tests used in conjunction with sulfa therapy to detect early symptoms of toxic reaction:

(1) Blood tests:

- (a) Hemoglobin level. Anemia is a toxic sign.
- (b) Differential white blood count. Reduced number of one type of white blood cell is a toxic sign.

(2) Urinalysis - Presence and amount of sulfa crystals is determined. Sulfa crystals may cause kidney damage.

h. Notes of interest regarding sulfa therapy:

- (1) Effectiveness of different sulfa preparations seems to vary. Certain organisms seem able to build up a resistance to a given preparation while another form of the drug is effective against that same organism. This reaction on the part of the organisms may change. Thus if one sulfa preparation is not effective against a given infection, another sulfa preparation may be effective.
- (2) Because of the danger of permanent kidney damage sulfa drugs should never be taken except under strict supervision of a doctor. Laboratory tests act as a safeguard against continuing the drug if there are poisonous effects.

Training Notes:

1. Stress need of strict supervision by a doctor in sulfa therapy.
2. Emphasize that all sulfa preparations are not equally effective against any given organism.
3. Stress importance of forcing fluids in a patient receiving sulfa therapy.

Sixth Period - One Hour  
Streptomycin and Other New Preparations

Place: Classroom

References: "Journal of the American Medical Association," Sept 22, 1946, pp 200; "Current Bulletins of U.S. Army Medical Department."

Instructional Aids:

Personnel: One man to act as lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

7th Hour - Lecture

Points to be Covered

Note to Instructor: Since constant research is being done with streptomycin and other new preparations changes in information about these drugs may be available from late Bulletins of the U.S. Army Medical Department or from teams in the hospitals who are actively engaged in the research.

1. Introduction:

a. The last few years have seen more than the usual number of medical discoveries announced. The majority of them were the result of war research. Research is still being done on most of these drugs. How useful they will prove to be is yet to be seen.

2. Explanation:

a. Streptomycin:

- (1) Source - streptomycin is prepared from a soil fungus. The drug comes in crystal form ranging in color from white to amber and, like penicillin, is put in solution for administration.
- (2) Use - at present research is being done on the treatment of urinary tract infections, septicemis, peritonitis, other infections caused by streptococci, staphylococci, pneumococci and other types of bacteria. How effective the drug will prove is yet to be seen.
- (3) Methods of administration:
  - (a) Intramuscular - preferred method
  - (b) Intravenous - seems to have no advantage over the intramuscular method of administration.
  - (c) Oral - used only for gastrointestinal tract infections.
  - (d) Locally - wet dressings and irrigations.

- (c) Injected into infected cavities - joints, plural cavity, etc.
- (4) Preparation - the drug is prepared in solution much the same as penicillin. It is measured in grams instead of units.
- (5) Dose - at present a dose of 2 to 4 grams per day given at 4 hour intervals is most commonly used.
- (6) Record - kept just as penicillin.
- (7) Toxic or poisonous reactions
  - (a) Pain and irritation at the site of the injection.
  - (b) Skin rash and fever
  - (c) Headache, nausea and vomiting - (believed to be due to presence of other substances in the drug.)
- (8) Drug fastness - the bacteria becomes immune to the drug much more rapidly than they do to the sulfa drugs or penicillin. When this happens the drug loses its effectiveness against that specific infection.

b. Anti-allergy drugs - several drugs show promise of being useful in the treatment of hay fever, hives and other allergic reactions. The most prominent of these drugs are benadryl.

c. New drugs are being used in the treatment of stomach ulcers. Apparently good results have been obtained from the use of amino acid preparations. Also an antiacid which is probably a new hormone, is being tried.

d. Research is underway on several drugs used similiar to penicillin and streptomycin. At present these drugs are not named but are given numbers to identify them. Nothing conclusive has been learned to date.

Training Notes:

1. Emphasize the fact that research may disclose new information about any new drug.
2. Explain that the army constantly conducts research in drugs independent of an in coordination with civilian authorities.

Seventh Period - Two Hours  
Narcotics

Place: Classroom

References: "A Manual of Pharmacology," T. Sollman, 6th Ed, pp 268-301; AR 40-1705, par 6; "Textbook of Materia Medica," Blumgarten, 7th Ed, pp 406-421, 541-546.

Instructional Aids:

Personnel: One lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

8th and 9th Hours - Lecture

Points to be Covered

1. Definition:

a. A narcotic is any drug which produces sleep or stupor and at the same time relieves pain. The army classifies only derivatives of opium and coca as narcotics.

2. Opium

a. Source: Opium is produced from the white poppy which grows in China, India, Turkey and Asia Minor.

b. Active principles are those parts of the drug on which the properties and actions depend. The most important active principles of opium are:

(1) Morphine

(a) Effects on the patient:

1. Pain is relieved
2. Patient becomes calm and abstracted, feels comfortable.
3. Patient is drowsy and usually falls asleep.
4. Breathing is slow and shallow.
5. Face is flushed and skin moist due to increased sweating.
6. Pupils are contracted.
7. On awakening the patient may be depressed.
8. Constipation may occur due to lessened peristalsis.

(b) Uses of Morphine:

1. To relieve pain
2. To produce sleep

3. To prepare for general anesthesia.
4. To lessen peristalsis
5. To lessen nervous excitement.

(c) Administration:

1. Usually given by hypodermic.
2. Given at intervals as ordered by the doctor.

(d) Tolerance to the drug is developed if given repeatedly.

(e) Precautions:

1. Watch for symptoms of poisoning:

- a. Extreme sweating.
- b. Pin point pupils
- c. Stupor or unconsciousness
- d. Respirations very slow and shallow
- e. Cyanosis

2. Idiosyncrasy or unexpected reaction may occur. The most common are:

- a. Nausea and vomiting
- b. Delirium and excitement
- c. Itching of the skin

3. Habit formation is easily induced and must be guarded against.

(2) Codeine

(a) Effects are similar to morphine with the following differences:

1. It does not produce sleep as readily.
2. It does not make the breathing as slow.
3. It depresses the cough reflex more.
4. It is not so constipating
5. It is not so apt to induce a habit.

(b) Uses of codeine:

1. To relieve pain
2. To relieve cough

(c) Administration:

1. Codeine may be given by mouth in tablet form or in cough mixture.

2. Codeine may be given by hypodermic injection.

3. Coca

a. Source: The drug is obtained from the dried leaves of a shrub which grows in South American countries.

b. Cocaine is the active alkaloid of coca.

(1) Effects on the patient:

(a) Applied to mucous membrane cocaine makes the membrane pale and reduces swelling.

(b) Cocaine relieves pain and produces anesthesia locally.

(c) After absorption:

1. It increases pulse and respiratory rate.

2. It makes the patient wakeful, talkative and excited.

(d) Use: Because of the great toxicity of cocaine it is permitted to be used in the army only as a local anesthetic in nose and throat work.

4. In civilian life the sale and use of habit forming drugs are controlled by the Harrison Drug Act.

5. Method for handling narcotics on wards:

a. Storage

(1) All narcotics must be kept in a separate locked container.

(2) Key to be carried by nurse at all times.

b. Ward narcotics register: Each ward must have a special record to account for all narcotic medications received or used on the ward.

c. Procedure in renewing ward supply:

(1) Each narcotic must be ordered on separate prescription signed by ward officer.

(2) Authorized person must collect narcotics from pharmacy and sign receipt in pharmacy.

(3) On delivery to ward, each narcotic will be checked, counted, locked in special container, and recorded in narcotic register.

d. Check of narcotics:

- (1) By nurse: Narcotics are counted and checked at least twice daily.
- (2) By ward officer: Narcotics are counted and checked three times a month: on the 10th, 20th and last day of each month.
- (3) By inspecting officer. Narcotics are checked once each month.

Training Notes:

1. Stress that narcotics are habit forming drugs.
2. Stress that narcotics are kept in specially locked containers and that the key is carried by nurse at all times.
3. Stress the importance of reporting questionable reaction of patient who has received morphine.

Eighth Period - One Hour  
Hypnotics

Place: Classroom

References: "A Manual of Pharmacology," T. Sellman, 6th Ed, pp 774-802; "Textbook of Materia Medica," Blumgarten, 7th Ed, Ch XXVIII.

Instructional Aids:

Personnel: One lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

10th Hour - Lecture

Points to be Covered

1. Introduction:

a. Hypnotics are drugs which produce sleep. The effects of hypnotics are similar to those of the general anesthetics, but they are milder, last longer, and do not relieve pain. Most hypnotic drugs are also sedatives, e.g. they lessen nervous excitement.

2. Explanation:

a. Methods of inducing sleep:

- (1) Eliminate disturbing worries or cares as much as possible.
- (2) Make the patient as comfortable as possible.
  - (a) Relieve itching of the skin with lotions.
  - (b) Bed covers just comfortably warm.
  - (c) Change position in bed if possible.
  - (d) Rub back with alcohol, etc.
- (3) Darken the room.
- (4) Eliminate noises and sounds.
- (5) Relieve hunger with a glass of warm milk.
- (6) Relieve pain by whatever method is indicated:
  - (a) Gas pains relieved by rectal tube or enema.
  - (b) Some types of pain may be relieved by use of ice cap or hot water bottle.
  - (c) Pain relieving drugs may be required.
- (7) Use of hypnotic drugs:
  - (a) Time of administration is important. Depending on how rapidly they act, they should be given  $\frac{1}{2}$  hour to 2 hours before bedtime.
  - (b) After a hypnotic drug has been given the patient should be kept in bed.

b. Hypnotic drugs:

- (1) Barbiturates are a group of synthetic drugs which vary in chemical structure.
  - (a) Uses:
    1. As a hypnotic
    2. As a sedative
  - (b) Administration - usually given by mouth in tablet or capsule form about 30 minutes before bed time. Sodium preparations may be given intravenously.
  - (c) Appearance of the patient:
    1. Patient usually becomes drowsy in 15 to 30 minutes after average dose.
    2. Patient usually falls asleep in 30 to 45 minutes.
    3. Sleep often resembles normal sleep and lasts for four to eight hours.
    4. Pulse and breathing are not usually affected.
    5. On awakening patient often complains of headache, dizziness, and drowsiness.

## (d) Precautions:

1. Continued use may develop a habit. To avoid the danger of addiction, the army takes the same precautions concerning recording and handling the drug that it takes with narcotics.
2. Self medication should be guarded against.

## (e) Commonly used barbiturates

1. Luminal (phenobarbital)
2. Nembutal
3. Seconal
4. Sodium amyta

## (2) Paraldehyde - a colorless liquid having a disagreeable taste and a pungent odor.

- (a) Used mainly with disturbed patients and alcoholics to produce sleep.
- (b) Administration - by mouth or per rectum. Unpleasant to take and give because of odor and taste.
- (c) Precaution - tolerance is readily established and habit formation is common, especially in alcoholics, who seem immune to the odor.

Training Notes:

1. Emphasize nursing measures for inducing sleep.
2. Stress that hypnotics should be used cautiously and only on order from a doctor.
3. Stress that the effect of a hypnotic depends to a large extent on the comfort of the patient.

Ninth Period - One Hour  
Sedatives

Place: Classroom

References: "A Manual of Pharmacology," T. Sollman, 6th Ed, pp 774-802; "Textbook of Materia Medica," Blungarten, 7th Ed, pp 421-425, 469-473.

Instructional Aids:

Personnel: One Lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

11th Hour - Lecture

Points to be Covered

1. Introduction:

a. The term sedative usually applies to drugs which act as nervous system depressants although it may be used in reference to a drug which lessens the activity of an organ of the body. Nervous system depressants lessen nervous excitation. Others may be sedative cough mixtures which soothe irritated mucous membrane or sedatives for bronchial spasm or cramps or diarrhoea. In all instances the sedative lessens activity.

2. Explanation:

a. The dose and time of administration decide to some extent the degree to which activity of the body is lessened. Thus these factors may decide whether a drug acts as a sedative or a hypnotic. Many drugs used as hypnotics may be given in smaller doses to act as sedatives. Drugs used primarily for these two purposes do not usually relieve pain to any great extent. We will be chiefly concerned here with sedatives which fall in the general classification of nervous system depressants. These drugs are used in treating the "nervous" patient.

b. Two principal groups of drugs used as sedatives:

(1) Bromides are salts of hydrobromic acid.

(a) Appearance of the patient after administration:

1. Nervous or excitable patient becomes calm and quiet.
2. Tremors or convulsions are lessened or prevented from recurring.
3. After continuous administration the patient becomes less active. He shows little interest in what is going on about him and becomes forgetful.
4. If given at bedtime it induces sleep.

(b) Uses:

1. They are especially useful to calm and quiet emotional and hysterical patients.
2. They are used to lessen muscle twitchings and convulsions.

3. They are used to lessen nervous heart action; to make a rapid pulse slower.

(c) Administration:

1. Bromides are given by mouth in either liquid or solid form.

2. Examples:

a. Liquid: Elixer of Triple Bromides.  
 b. Solid: Tablets of Sodium Bromide.

(d) Poisonous effects:

1. Acute poisoning occurs very rarely.

2. Cumulative poisoning may occur. This means the drug is rapidly absorbed and slowly excreted so that it accumulates in the body. The symptoms are exaggerated effects of the drug accompanied by skin rash. They are relieved by stopping the drug. More active treatment may consist of hot baths, saline cathartics, caffeine or strychnine as antidotes.

(2) Barbiturates are synthetic compounds.

(a) Appearance of the patient after administration:

1. Patient usually becomes sleepy.

2. After sleeping the patient may complain of headache and dizziness. They sometimes have vivid dreams during sleep.

3. Nervous irritability is lessened.

(b) Uses as a sedative:

1. To lessen worry and apprehension.

2. To lessen nervous irritability and hysteria.

(c) Administration: Barbiturates are usually given by mouth for sedative effect but some preparations of the drug may be given by intramuscular or intravenous injection.

(d) Poisonous effects:

1. These usually occur from overdose.

2. There is stupor, subnormal temperature, low blood pressure, weak irregular pulse, cyanosis. Death may result.

3. Treatment consists of washing out the stomach, saline intravenously, sodium bicarbonate by mouth for acidosis, strychnine as an antidote and oxygen for cyanosis.

(e) Advantages over Bromides:

1. Act more promptly
2. Deeper sedative effects may be reached.
3. Cumulative poisoning does not occur.

(f) Precautions:

1. Habit formation occurs easily.
2. Avoid self medication.

(g) Commonly used preparations:

1. Luminal (phenobarbital) in tablets or in liquid form Elixir Phenobarbital.
2. Veronal (Barbital) in tablets.
3. Sodium amytal in ampoules or tablets.
4. Seconal in capsules or suppositories.

Training Notes:

1. Stress dangers of self medication in using sedatives.
2. Stress habit formation.
3. Emphasize watching for signs of cumulative poisoning with Bromides.

Tenth Period - Two Hours  
Anesthetics

Place: Classroom

References: TB Med #43 dtd 18 May '44; "A Manual of Pharmacology," Sollman, pp 307-327; "Textbook of Materia Medica," Blumgarten, 7th Ed, Ch XXVII, pp 726-774.

Instructional Aids:

Personnel: One man to act as lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

12th and 13th Hours - Lecture

Points to be Covered

## 1. Definition:

a. Anesthetics are drugs which produce insensibility to pain. Depending on the agent used and the method of administration they may affect the entire body with loss of consciousness, or they may effect only a part of the body with no loss of consciousness.

## 2. History of Anesthesia:

a. In ancient times various drugs were used in an attempt to relieve pain. From time immemorial it has been an aim of man to learn the true explanation for pain and to find an effective relief from pain. Many of the earliest efforts had drastic results. Not much advance was made until the middle of the nineteenth century.

b. Surgery prior to the advent of modern anesthesia was a horrible ordeal. Strong men held the patient down while the surgeon attempted to operate. The patient's only relief was in fainting. Profound shock to the patient was the rule. The disadvantages to surgery are obvious:

- (1) Careful surgery was impossible. The patient moved and his cries unnerved the surgeon.
- (2) Speed was of utmost importance and took precedence over the technique of surgery.

## c. History of modern anesthesia.

(1) Ether was first discovered in 1540 by Cordus but its use as an anesthesia did not come into being until the middle of the 19th century. At that time ether frolics were in vogue. People would inhale ether until they became intoxicated and then amused others by their antics. The following day they noticed cuts and bruises they were not conscious of at the time they were received. This led doctors to reason they could use ether as an anesthetic and operate on the person while under its influence. A Dr. Long of Georgia used ether for surgery and was accused of witchcraft and butchery. He failed to publish his findings. In 1846 a Dr. Morton gave the first demonstration of clinical anesthesia in Massachusetts. This began the modern era of anesthesia, and since that time various agents and methods of administration have been discovered.

## 3. Methods of Administration and Agents used:

- a. Local anesthesia produces loss of sensation only in a

given area and does not produce unconsciousness.

- (1) Surface or topical application means the agent is simply put on the surface. The best example is cocaine applied to the mucous membrane of the nose for operations in that area.
- (2) Local infiltration means the agent is injected into the tissues of the area to be subjected to surgery. Procaine solution is frequently used in this way.
- (3) Regional anesthesia means a region or area of the body is desensitized by injecting an anesthetic agent around the nerve leading from that part or into the subarachnoid space of the spinal canal.
  - (a) Nerve block - the agent is injected around the nerve thereby making it impossible for that nerve to carry impulses of pain to the central nervous system. Agents of short duration (one to two hours, such as procaine or one of the allied drugs) may be used for operations. Agents of long duration (four to six months) may be used to relieve pain of cancer or other incurable conditions. Examples of such agents are alcohol and snake venom.
  - (b) Spinal anesthesia is a form of block anesthesia in which the agent is introduced into the spinal canal. In general it desensitizes the body below the site of injection. Some agents used are procaine and pontocaine.

b. General anesthesia produces loss of sensation over the entire body and loss of consciousness.

(1) Intravenous anesthesia

- (a) Sodium pentothal was widely used for war surgery. Complete anesthesia is quickly and easily induced and easy to maintain. Relatively few toxic reactions occur.
- (b) Advantages of intravenous anesthesia are the simple equipment required and the ease of induction.

(2) Inhalation anesthesia

(a) Methods of administering

1. Open method - a mask covered with gauze is held over the patient's nose and mouth, over which the anesthetic is slowly poured drop by drop.

2. Closed method - a special apparatus or anesthesia machine is used which, when placed over the patient's nose and mouth, constitutes a closed system. Since the patient re-breathes constantly through this system a method is provided for removal of carbon dioxide (with soda lime).
3. Semiclosed method - a closed method type of apparatus is used, but a valve on the mask permits expiration outside the system. Re-breathing is not excessive in this method.

(b) Agents used for inhalation anesthesia:

1. Nitrous Oxide
2. Ethyl Chloride
3. Chloroform
4. Ether
5. Others

(3) Combined or balanced anesthesia may be used to obtain the combined advantages of different agents.  
Examples:

- (a) Sodium Pentothal intravenously combined with Nitrous Oxide gas.
- (b) Spinal anesthesia combined with Nitrous Oxide gas.

4. Pre-anesthetic care and medications:

a. Complete physical examination with especial attention to heart and lung.

b. Empty gastrointestinal tract.

- (1) Limited diet prior to operation.
- (2) Cathartics or enemata as ordered.

c. Remove false teeth.

d. Medications ordered are usually sedatives or hypnotics given the night before operation and the morning of operation. Morphine or some similar drug may be ordered just prior to operation to aid in the induction stage of the anesthesia. Atropine may be ordered to lessen secretions of the respirations and to strengthen the heart.

5. Post anesthetic care:

- a. Patient should not be left alone until he is conscious.

- b. Check respirations and pulse frequently.
- c. Medications as ordered for restlessness and pain.

#### 6. Notes of Interest:

a. The anesthetic agent and method of administration are decided on by the doctor according to the condition of the patient and the surgery to be performed.

b. Only authorized personnel are permitted to give an anesthetic. The army authorized doctors and nurse anesthetists.

c. Some anesthetic agents, particularly those given by inhalation, are highly inflammable or explosive.

#### Training Notes:

1. Emphasize that an anesthetic is chosen to suit the patient.
2. Emphasize that only authorized personnel give anesthetics.

#### Eleventh Period - One Hour Sulfonamides and Penicillin Review

Place: Classroom

References: TB Med 112-1944, "A Manual of Pharmacology," Sollman, pp 638-648.

#### Instructional Aids:

Personnel: One man to act as lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

#### 14th Hour - Conference

#### Points to be Covered

Note to Instructor: Since this is a review class it should be conducted as a conference bringing out the important points of periods 4 and 5. The following outline may be used as a guide from which to direct the conference.

#### 1. Sulfa drugs:

- a. Action
- b. Uses

- c. Administration
- d. Toxic reactions
- e. Nursing care of patient

2. Penicillin

- a. Uses
- b. Preparation
- c. Administration
- d. Penicillin record

Training Notes:

1. Emphasize points brought out in periods 4 and 5.

Twelfth Period - One Hour  
Poisons

Place: Classroom

References: TM 8-260, Chapter III, Sec X; "A Manual of Pharmacology," Sollman, pp 60-65.

Instructional Aids:

Personnel: One man to act as lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notobook and pencil

15th Hour - Lecture

Points to be Covered

1. Introduction

a. A poison is a substance which is injurious to the body either temporarily or permanently. Whether or not a substance is a poison may depend upon the way it is used, the amount used, and concentration used. Almost any drug will act as a poison if an overdose is taken.

2. Explanation:

a. Types of poisoning:

- (1) Acute - caused by taking an overdose of any drug or other toxic agent and the symptoms usually follow promptly after its ingestion.
- (2) Cumulative - occurs when drugs are taken over a long period of time in excess to the patient's ability to tolerate them. The drug accumulates in the body. Symptoms and treatment vary with each type of drug. Some general rules will follow.

b. Injurious effects of poisons:

- (1) Local - signs of irritation on the skin or mucous membranes with which the poison comes in contact.
- (2) General - changes in body function which result from the effect of poisons on various organs. The essential symptoms of each poison are usually exaggerated effects obtained from ordinary doses.

c. Symptoms of acute poisoning:

- (1) Sudden onset of illness with severe symptoms.
- (2) Severe abdominal pain, nausea, and vomiting may be present.
- (3) Symptoms of shock and collapse may occur.
- (4) Convulsions may occur.

d. Acute poisoning may be suspected if:

- (1) Any person previously in good health, suddenly becomes ill with symptoms of poisoning.
- (2) Patient states he has taken poison.
- (3) Empty poison bottle or container is found near patient.

e. Treatment of acute poisoning:

- (1) Notify the nurse or doctor.
- (2) Attempt to remove the poison by:
  - (a) Inducing vomiting
  - (b) Lavage
- (3) Administer antidote only after poison has been identified.
  - (a) Antidote - any measure, or agent which will remove, prevent the absorption of, or counteract the effects of a poison.
  - (b) Common poisons and antidotes:

1. Strong acid - weak alkalies
2. Strong alkalies - weak acid
3. Phenol - alcohol or equal parts of water and glycerine
4. Bichloride of mercury - raw eggs or milk
5. Iodine - starch solution

- (4) If no antidote is available dilute poison by giving water.
- (5) Treat patient for collapse.

f. Care of poisons on the ward:

- (1) All substances which are likely to destroy life or seriously endanger health when applied externally to the body or when taken internally in a dose of less than one teaspoon are labeled "poison" by the pharmacy before being issued to the ward.
- (2) Poisons should be kept on separate shelf from internal medications in the medicine cupboard.
- (3) Poisons should be kept locked at all times.

Training Notes:

1. Stress keeping poisons labeled as such and keeping them locked
2. Emphasize points in recognizing acute poisoning.
3. Emphasize treatment of acute poisoning.



PERIOD	HOURS	WEEK	SUBJECT
1	2	1	Review of Simple Mathematics
2	2	2	Review of Simple Mathematics
3	1	3	Centigrade and Fahrenheit Scales
4	3	4	Metric and Apothecaries System
5	2	5	Percentage and Ratio of Solutions
5	10		TOTAL

1. Purpose and Scope: The purpose of this course is to review such phases of mathematics as may be of value to the Technician and to familiarize them with the relationship between mathematics and their future work with technical equipment and medicines used in the hospitals.

The scope of the subject will include Review of Simple Mathematics; Centigrade and Fahrenheit Scales and the conversion of one to the other; Metric and Apothecaries Systems of Measurement and their conversion from one to the other; Percentage and Ratios of Solutions and the mathematics of making solutions.

2. Standard of Proficiency: At the completion of the course each student should:

a. Be able to solve simple problems in decimals, fractions, percentage, ratios and proportions.

b. Have a practical and working knowledge of different types of solutions:

- (1) Solid in liquid
- (2) Gas in liquid
- (3) Liquid in liquid

c. Know how to prepare solutions of a given amount and strength from:

- (1) A liquid of a different strength.
- (2) A pure solid drug.
- (3) A tablet of a given strength.

3. Basic References: TM 1-900; Any standard textbook of Mathematics

First Period - Two Hours  
Review of Simple Mathematics

Place: Classroom

References: TM 1-900 (Any standard textbook of Mathematics)

Instructional Aids:

Personnel: None

Equipment: Mimeographed Math Quiz #1 and #2

Individual Equipment: Notebook and pencil

1st and 2nd Hours - Conference, Demonstration, Application

Points to be Covered

1. Introduction

a. Purpose

- (1) A review of simple mathematics is usually a necessary procedure in any course of study. Many everyday tasks involve the use of addition and subtraction, both in whole numbers and fractions.
- (2) Many students have not bothered with arithmetic since grammar school days. A review in mathematics will serve a valuable purpose.

b. Method of Procedure

- (1) No attempt will be made to change the student's method of doing his problems. In most cases his method is best for him.
- (2) However if the student feels that his method does not serve him well he is invited to make an appointment with the instructor to improve his method of work.

2. Explanation

a. Addition

(1) Points to remember

- (a) Keep figures in neat rows under each other.
- (b) Review the number combinations which will lead to more rapidity in adding.
- (c) Check the problem by adding down if the first time added was up. (vice versa)

## b. Subtraction

## (1) Points to remember

- (a) Keep figures in neat rows under each other.
- (b) The top number is the numerator.
- (c) The bottom number is the denominator.
- (d) The answer is the remainder.
- (e) Check problem by adding denominator and remainder.  
If problem was done correctly the answer will be the same as the numerator.

## c. Multiplication

## (1) Points to remember

- (a) The top number is the multiple.
- (b) The number that does the multiplying is the "multiplier."
- (c) The answer is the "product."
- (d) To check: Divide the product by the multiplier and if the answer is correct the result of the division will be the "multiplier."

## d. Division

## (1) Points to remember

- (a) The number to be divided is the "dividend."
- (b) The number that does the dividing is the "divisor."
- (c) The answer is the "quotient."
- (d) To check: If the quotient is correct--the quotient multiplied by the multiple should be the same as the dividend.

## e. Quiz number one

## f. Decimal Fractions

## (1) Definitions

- (a) A decimal fraction is a part of a unit expressed as a number containing a decimal point.
- (b) Scale of arrangement--similar to our money system.

1. Thousands--1000.00
2. Hundreds--100.00
3. Tens--10.00
4. Units--1.00
5. Tenths--0.1
6. Hundredths--0.01

7. Thousandths--0.001
8. Ten thousandths--0.0001

(c) Addition of decimal fraction

1. Same as addition above, except decimal points should be one right under the other in a vertical line.

(d) Subtraction of decimal fractions

1. Place the longer fraction over the smaller one.
2. Decimal points in a vertical line under each other.
3. Proceed as in regular subtraction problem.

(e) Multiplication of decimal fractions

1. Multiply the same way as for whole numbers.
2. Count off from left to right in the answer and place the decimal point as many places as there are in the problem.

(f) Division of decimal fractions

1. Count the number of places to the right in the number that is to do the dividing.
2. Move the decimal point in the number that is to be divided up the same number of places to the right.
3. Show this new place with an arrow.
4. Place the answer's decimal point directly above this arrow.
5. Proceed as in long division.

(g) Quiz number two.

Second Period - Two Hours  
Review of Simple Mathematics

Place: Classroom

References: TM 1-900 (Any standard textbook of Mathematics)

Instructional Aids:

Personnel: None

Equipment: Mimeographed Math Quix #3 and #4

Individual Equipment: Notebook and pencil

3rd and 4th Hours: Conference, Demonstration, Application

Points to be Covered

1. Introduction

a. Definitions

- (1) A fraction is any part of a unit (any part of a whole piece)
- (2) A common fraction is made up of 2 or more numbers or terms and a dividing line.
- (3) The top number is the numerator.
- (4) The bottom number is the denominator.

2. Explanation

a. Addition of fractions when the denominators are the same.

- (1) Add only the top numbers.
- (2) The denominators remain the same.

b. Addition of fractions when the denominators are different.

- (1) The denominators are changed so that they will all be the same by multiplying all the denominators together to get what is called the "Common Denominator."
  - (a) Common denominator is that number which can be evenly divided by every one of the original denominators.
  - (2) Divide each original denominator into the common denominator.

- (3) Multiply each numerator by the number of times its denominator goes into the common denominator.
- (4) The results of the multiplication are the new numerators.
- (5) Proceed with addition as when denominators are the same.

c. Subtraction of Fractions

- (1) Process is the same as in addition.
- (2) Be sure larger number is on top.

d. Multiplication of Fractions

- (1) Multiply the numerators together and the result is the new numerator.
- (2) Multiply the denominators together and the result is the new denominator.
- (3) Reduce the resulting fraction to its lowest term.

e. Division of Fractions

- (1) Invert (turn upside down) the second fraction--the one which is to do the dividing.
- (2) Proceed as in multiplication.

f. Mathematics Quiz number three

g. Roman Numerals

(1) Purpose

- (a) The apothecary system of measuring uses Roman Numerals instead of Arabic--a knowledge of Roman Numerals is therefore necessary.

(2) Scope

- (a) For this purpose only 1-100 is necessary to know.

(3) Written as follows

- (a) I-1  
II-2  
III-3

Repeating a letter repeats its value III is I I I

- (b) V-5  
X-10

- (c) To place I to the left of V or X makes the unit one less. To place I to the right of V or X

makes the unit one more.

IV-4	IX-9
VI-6	XI-11

(d) XX-20  
XXX-30  
L-50

(e) X placed to the left of L means 40  
X placed to the right of L means 60

(f) C-100  
X placed to the left of C means 90

(g) D-500  
M-1000

(4) Mathematics Quiz number four.

Third Period - One Hour  
Centigrade and Fahrenheit Scales

Place: Classroom

References: TM 8-233, par 5, 6, 8, 9, 18

Instructional Aids:

Personnel: None

Equipment: Mimeographed Math Quiz #5

Individual Equipment: Notebook and pencil

5th Hour - Conference, Demonstration, Application

Points to be Covered

1. Introduction

a. General Explanation

(1) Thermometers are calibrated by determining the height of the liquid in the stem at two fixed and easily reproducible temperature levels, namely:

1. The temperature of melting ice.
2. The temperature of the steam immediately above pure water boiling at a normal barometric pressure of 760 mm. of mercury.

- (2) After those two points are determined the distance between the two points is divided into a large number of equal intervals called "degrees."
- (3) There are two "scales of temperature" in common use.
  - (a) Centigrade-for scientific work.
  - (b) Fahrenheit-used for recording household temperature and "clinical thermometers."

## 2. Explanation

### a. Centigrade Scale

- (1) The lower mark is  $0^{\circ}$  C - the higher mark is  $100^{\circ}$  C. The distance between the two points being  $100^{\circ}$ .

### b. Fahrenheit Scale-1

- (1) The lower mark is  $32^{\circ}$  F - the higher mark is  $212^{\circ}$  F. The distance between the two points being divided into 180 equal degrees.

### c. Difference between the two scales

- (1) It is obvious that  $0^{\circ}$  C =  $32^{\circ}$  F.
- (2) The 100 Centigrade degrees are equal to 180 Fahrenheit
- (3)  $1^{\circ}$  C =  $9/5^{\circ}$  F and vice versa  $9/5^{\circ}$  F =  $1^{\circ}$  C.

### d. Formulas for interchanging

#### (1) Centigrade to Fahrenheit

- (a) Multiply by 9, divide by 5, and add 32, or multiply by 1.8 and add 32.

- (2) Change  $100^{\circ}$  C to Fahrenheit:  $100 \times 1.8 + 32 = 212^{\circ}$  F.

- (3) Fahrenheit to Centigrade: Subtract 32, multiply by 5, and divide by 9, or subtract 32 and divide by 1.8.

- (4) Change  $212^{\circ}$  F to Centigrade:  $212 - 32, 180 \div 1.8 = 100^{\circ}$  C.

- (5) Mathematics Quiz Number five.

Fourth Period - Three Hours  
Metric and Apothecaries System

Place: Classroom

References: TM 8-233, pars 5, 6, 8, 9, 18

Instructional Aids:

Personnel: None

Equipment: Mimeographed Math Quiz #6 and #7

Individual Equipment: Notebook and pencil

6th, 7th, and 8th Hours: Conference, Demonstration, Application

Points to be Covered

1. Introduction

a. Purpose of lesson

- (1) Some doctors still use the apothecary system when ordering medications.
- (2) Fluid intake and output of a patient is often referred to in ounces and pints.
- (3) The Metric system is the official system for measuring in the army, but the remnants of the apothecary system still hang on; therefore, some knowledge of this system is necessary.

2. Explanation

a. Origin of various terms

(1) Weight

- (a) Grain - this word comes from the Latin "gramum", meaning the smallest seed. A grain of wheat was selected from the middle ear of a head of wheat and was used as the unit of weight. This is now standardized and an aluminum weight is used instead of a grain of wheat.
- (b) Other weights (increasing in size)

1. Scruple (ʒ) This was originally the lowest unit of weight used by the Romans.
2. Dram (ʒ) or written dracham--the weight equivalent of this was a Greek silver coin.
3. Ounce (ʒ) a Greek term applied to 1/20th of any magnitude, whether length, surface or capacity. (the ounce is 1/12 of a Troy pound)
4. Pound - of Roman origin and signifies a balance

(c) Methods of writing

1. Symbols are used to designate various units.  
The actual quantity being written following the symbol and written in Roman numerals.
2. Fractional quantities are written as common fractions with the exception of  $\frac{1}{2}$ , which is written "ss" (Latin "semisis")

## (2) Liquid

- (a) Minin - the word comes from the word minimum - The least; smallest.
- (b) Fluidram symbol - (ʒ) or (fʒ).
- (c) Fluidounce - symbol (ʒ) or (fʒ).

### b. Table of Apothecaries' (or Troy) weight

- (1) 20 grains = 1 scruple
- (2) 3 scruples = 1 dram
- (3) 8 drams = 1 ounce
- (4) 12 ounces = 1 pound

### c. Table of Apothecaries' (or wine) weight

- (1) 60 minims = 1 fluidram
- (2) 8 fluidrams = 1 fluidounce
- (3) 16 fluidounces = 1 pint
- (4) 2 pints = 1 quart
- (5) 4 quarts = 1 gallon

### d. Metric system

- (1) The metric system is an accurate way of measuring used the world over.
- (2) Origin of the metric system. One fourth of the distance around the earth was measured (through both poles). That length was subdivided into 10 million parts. One part of the 10 million parts was selected to be the measure of length and was called a meter.
- (3) Capacity-Liter--one tenth of a meter was taken and a box was built, one tenth of a meter long, one tenth of a meter wide and one tenth of a meter high. This was the unit of capacity and was called a "liter."
- (4) The gram--This box was filled with plain water.  $\frac{1}{1000}$ th part of that liter of water was removed and weighed. The weight of this water was called a gram. Therefore one milliliter ( $\frac{1}{1000}$ th of a liter) weighs one gram.
- (5) Units
  - (a) Unit of length--meter
  - (b) Unit of capacity--liter
  - (c) Unit of weight--gram

(6) Subdivisions of the following units are expressed by adding the following prefixes:

- (a) Deci--1/10th of a unit
- (b) Centi--1/100th of a unit
- (c) Milli--1/1000th of a unit
- (d) Deka--10 times a unit
- (e) Hecta--100 times a unit
- (f) Kilo--1000 times a unit

(7) Only the underlined in the following table need to be memorized.

<u>Length</u>		<u>Volume</u>		<u>Weight</u>	
<u>kilometer</u>	km	<u>kiloliter</u>		<u>kilogram</u>	kg 1000
<u>hectometer</u>		<u>hectoliter</u>		<u>hectogram</u>	100
<u>dekameter</u>		<u>decaliter</u>		<u>dekagram</u>	10
<u>meter</u>	m	<u>liter</u>		<u>gram</u>	gm 1
<u>centimeter</u>	cm	<u>centiliter</u>		<u>centigram</u>	.01
<u>millimeter</u>	mm	<u>milliliter</u>		<u>milligram</u>	mg .001

#### e. Metric System Equivalents

##### (1) Length

- (a) 1 meter = 39 inches
- (b) 25 mm = 1 inch
- (c) 2.5 cm = 1 inch
- (d) 1 kilometer = 1 mile

##### (2) Weight

- (a) 1 kilogram = 2.2 pounds
- (b) 30 grams = 1 ounce
- (c) 1 gram = 15 grains

##### (3) Capacity

- (a) 1 liter = 1000 milliliters or 1000 centiliters
- (b) 30 c.c. = 1 fluidounce
- (c) 1 c.c. = 15 minims, or drops

#### f. Demonstration (approximate equivalents)

<u>Metric</u>	<u>Apothecary</u>	<u>Household</u>
1000 c.c.	1 quart	1 quart
500 c.c.	1 pint	1 pint
30 c.c.	1 ounce	2 tablespoons
4 c.c.	1 dram	1 teaspoon
1 c.c.	15 minims	1 drop
	1 minim	

<u>Metric</u>	<u>Apothecary</u>	<u>Household</u>
240 c.c.	8 ounces 5 ounces	1 glassfull 1 teacup

- g. Mathematics Quiz number six
- h. Mathematics Quiz number seven

Fifth Period - Two Hours  
Percentage and Ratio of Solutions

Place: Classroom

References: TM 8-233, Chap 2, Sec. VI, VII, VIII

Instructional Aids:

Personnel: None

Equipment: Mimeographed Math Quiz #8

Individual Equipment: Notebook and pencil

9th and 10th Hours - Conference, Demonstration, Application

Points to be Covered

**1. Introduction**

a. The technician may be required to prepare solutions for use of the ward.

b. The strength of solutions is expressed either as percentage or ratio.

**2. Explanation**

a. Review of definitions

- (1) Percentage means parts in 100. Thus 5% means 5 parts of 100. Expressed as a fraction 5% equals  $5/100$ .
- (2) Ratio is the relation between the quantity of the drug and the fluid in which it is dissolved. Thus 3:10 means 3 parts of the drug in 10 parts of solution.
- (3) Proportion is the relation between two equal ratios. In proportion the product of the means is equal to the product of the extremes. The "means" are the two inner numbers of the proportion and the "extremes" are the two outer numbers.  
Example: 3 is to 10 as 6 is to 20

$$\begin{array}{r}
 3 : 10 :: 6 : 20 \\
 3 \times 20 = 10 \times 6 \\
 60 = 60
 \end{array}$$

### b. Solutions

(1) Definition: A solution is a liquid in which a solid, gas, or another liquid has been dissolved.

### (2) Examples

- (a) Solid in liquid, saline solution
- (b) Gas in liquid, Hydrogen peroxide
- (c) Liquid in liquid, lysol 5%

### (3) Making solutions:

#### (a) Rule expressed as a proportion

1. Strength desired
2. Strength on hand
3. Amount of drug to be used
4. Amount of solution wanted

#### (b) Examples

1. To make 500 cc of a 5% solution from a 20% solution

Strength desired: 5% ( $5/100$ )

Strength on hand: 20% ( $20/100$ )

Amount of drug to be used: unknown (y)

Amount of solution wanted: 500 cc

$5/100 : 20/100 :: y : 500$

$$20/100 \times y = 5/100 \times 500$$

$$20y/100 = 2500/100$$

$$1/5y = 25$$

$$y = 125$$

Answer: Take 125cc of 20% solution and add water up to 500cc to make 500cc of a 5% solution.

2. To make 800 cc of a 1 : 200 solution from pure crystals (metric system of measure must be used throughout)

Strength desired: 1 : 200 or  $1/200$

Strength on hand: 100% or 1

Amount of drug to be used: Y gms

Amount of solution wanted: 800 cc

$$\begin{aligned}1/200 : 1 :: Y : 800 \\1 \times Y = 1/200 \times 800 \\ \therefore Y = 4 \text{ gms}\end{aligned}$$

Answer: 4 gms of the crystals will be dissolved in water to make 800 cc for 800 cc of a 1 : 200 solution.

3. To make 6000 cc of a 1 : 2000 solution from tablets containing 1/2 gm (pure drug)

Strength desired = 1 : 2000 or 1/2000

Strength on hand = 100% or 1

Amount of drug to be used = Y gms

Amount of solution wanted = 6000 cc

$$1/2000 : 1 :: Y : 6000$$

$$1 \times Y = 1/2000 \times 6000$$

$Y = 3$  gms (amount of pure drug to be used)

Tablets on hand = 1/2 gm

Divide amount to be used by the strength of the tablet on hand to determine number of tablets to use.

$$3 \text{ gms} \div 1/2 \text{ gm} = 6 \text{ tablets}$$

Answer: Dissolve 6 of the 1/2 gm tablets in water up to 6000 cc to make 6000 cc of a 1:2000 solution.

(4) Mathematics Quiz number eight

PRINT

(LAST NAME)

(FIRST NAME)

(MIDDLE INITIAL)

MATHEMATIC QUIZ NO. 1ADDITION:

$$\begin{array}{r}
 648 \\
 391 \\
 + 211 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 6438 \\
 9741 \\
 + 7026 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 38,469 \\
 78,429 \\
 + 63,987 \\
 \hline
 \end{array}$$

SUBTRACTION:

$$\begin{array}{r}
 746832 \\
 - 518987 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 983246 \\
 - 48899 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 800632 \\
 - 486329 \\
 \hline
 \end{array}$$

MULTIPLICATION:

$$\begin{array}{r}
 6432 \\
 \times 22 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 87431 \\
 \times 20 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 984376 \\
 \times 48 \\
 \hline
 \end{array}$$

DIVIDE:

$$24) 86329$$

$$96) 843297$$

$$32) 68457$$

THESE PROBLEMS ARE NOT COMPULSORY: CAN BE DONE BY STUDENTS WHO HAVE FINISHED OTHERS:

$$\begin{array}{r}
 86479 \\
 \text{ADD} \quad 39466 \\
 28974 \\
 39862 \\
 + 74691 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 9430988 \\
 \text{SUBTRACT} \quad - 8674397 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 89756879 \\
 \text{MULTIPLY} \quad \times 89 \\
 \hline
 \end{array}$$

## MATH QUIZ

PRINT

(LAST NAME) (FIRST NAME) (MIDDLE INITIAL) COURSE

UNDERLINE ANSWERS TWICE:

ADD:	247	672	779
	389	899	432
	746	776	541
+	<u>538</u>	<u>588</u>	<u>866</u>

SUBTRACT:

76439	98765	86432
<u>- 51688</u>	<u>- 43211</u>	<u>- 51409</u>

MULTIPLY:	88976	874321	9246
	<u>x 432</u>	<u>x 033</u>	<u>x 597</u>

DIVIDE:

674)93684	22)8743	97)687432
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PRINT

(LAST NAME)

(FIRST NAME)

(MIDDLE INITIAL)

## MATHEMATICS QUIZ NO. 2

## ADDITION:

$$\begin{array}{r}
 7.4321 \\
 + 9846 \\
 + \underline{.3211} \\
 \hline
 10.8632 \\
 + 11.4682 \\
 + \underline{.0097} \\
 \hline
 .8301 \\
 167.21 \\
 + \underline{84.0076} \\
 \hline
 \end{array}$$

## SUBTRACTION:

$$\begin{array}{r}
 82.497 \\
 - 3.906 \\
 \hline
 197.4837 \\
 - 20.0760 \\
 \hline
 1897.42 \\
 - 19.98 \\
 \hline
 \end{array}$$

## MULTIPLICATION:

$$\begin{array}{r}
 98.63 \\
 \times 4.09 \\
 \hline
 2953.22 \\
 \times .86 \\
 \hline
 74.063 \\
 \times .28 \\
 \hline
 \end{array}$$

## DIVISION:

$$\begin{array}{r}
 2.8) \underline{97.36} \\
 .86) \underline{4683.209} \\
 3.3) \underline{8543.26} \\
 \end{array}$$

THESE PROBLEMS ARE NOT COMPULSORY: TO BE DONE BY STUDENTS WHO HAVE  
COMPLETED OTHERS:

ADDITION: 86.9432

MULTIPLICATION:

2.0741

94.3768

DIVISION:

9.8367

x .97

8.9) \underline{4978.87}

+ 4.2966

## MATHEMATICS QUIZ NO. 2

PRINT

(LAST NAME) (FIRST NAME) MIDDLE INITIAL) COURSE

Problem	Work Column	Answer
Add: $\frac{1}{3} + \frac{2}{3} + \frac{3}{3} + \frac{4}{3}$		Answer:
Add: $\frac{2}{5} + \frac{3}{10} + \frac{2}{4} + \frac{1}{2}$		Answer:
Subtract: $\frac{5}{10} - \frac{3}{10}$		Answer:
Subtract: $\frac{8}{25} - \frac{4}{15}$		Answer:
Multiplication: $\frac{2}{8} \times \frac{4}{9} \times \frac{5}{10} \times \frac{2}{3}$		Answer:
Division: $\frac{2}{3} \div \frac{1}{150}$		Answer:

## MATHEMATICS QUIZ NO. 3

NAME \_\_\_\_\_

	Work Column.	Answer
<u>Add:</u> $\frac{1}{4} + \frac{3}{4} + \frac{2}{4} + \frac{5}{4}$		
<u>Add:</u> $\frac{2}{5} + \frac{3}{10} + \frac{2}{4} + \frac{1}{2}$		
<u>Subtract:</u> $\frac{8}{25} - \frac{4}{15}$		
<u>Subtract:</u> $\frac{5}{10} - \frac{3}{10}$		
<u>Multiply:</u> $\frac{2}{8} \times \frac{4}{9} \times \frac{5}{10} \times \frac{2}{3}$		
<u>Divide:</u> $\frac{2}{3} \div \frac{1}{150}$		
(These Problems to be done by students who have finished)		
<u>Add:</u> $\frac{8}{10} + \frac{9}{15} + \frac{2}{3} + \frac{2}{9}$		
<u>Subtract:</u> $\frac{83}{120} - \frac{23}{80}$		
<u>Multiply:</u> $\frac{4}{5} \times \frac{8}{15} \times \frac{4}{16} \times \frac{2}{9} \times \frac{15}{45}$		
<u>Divide:</u> $\frac{9}{18} \div \frac{7}{20}$		

MATHEMATICS QUIZ NO. 4

NAME \_\_\_\_\_

Write the following as Arabic Numerals:

X \_\_\_\_\_ V \_\_\_\_\_ I \_\_\_\_\_ II \_\_\_\_\_ IV \_\_\_\_\_

XI \_\_\_\_\_ XII \_\_\_\_\_ IX \_\_\_\_\_ VIII \_\_\_\_\_ VII \_\_\_\_\_

Write as Roman Numerals:

2 \_\_\_\_\_ 4 \_\_\_\_\_ 3 \_\_\_\_\_ 5 \_\_\_\_\_ 10 \_\_\_\_\_ 9 \_\_\_\_\_

12 \_\_\_\_\_ 6 \_\_\_\_\_ 8 \_\_\_\_\_ 11 \_\_\_\_\_ 7 \_\_\_\_\_ 13 \_\_\_\_\_

Write as Arabic Numerals:

XXI \_\_\_\_\_ XXXIII \_\_\_\_\_ XXV \_\_\_\_\_ XXIX \_\_\_\_\_ XXVI \_\_\_\_\_

Write as Roman Numerals:

15 \_\_\_\_\_ 20 \_\_\_\_\_ 17 \_\_\_\_\_ 23 \_\_\_\_\_ 36 \_\_\_\_\_ 40 \_\_\_\_\_

39 \_\_\_\_\_ 45 \_\_\_\_\_ 49 \_\_\_\_\_ 48 \_\_\_\_\_ 35 \_\_\_\_\_ 19 \_\_\_\_\_

Write as Arabic Numerals:

XC \_\_\_\_\_ XCI \_\_\_\_\_ XCV \_\_\_\_\_ LX \_\_\_\_\_ LXX \_\_\_\_\_ LXXXV \_\_\_\_\_

Write as Roman Numerals:

53 \_\_\_\_\_ 79 \_\_\_\_\_ 64 \_\_\_\_\_ 81 \_\_\_\_\_ 99 \_\_\_\_\_ 57 \_\_\_\_\_

63 \_\_\_\_\_ 92 \_\_\_\_\_ 70 \_\_\_\_\_ 65 \_\_\_\_\_ 98 \_\_\_\_\_ 61 \_\_\_\_\_

## MATHEMATICS QUIZ NO. 5

NAME \_\_\_\_\_

The Fahrenheit scale is divided into \_\_\_\_\_ degrees

Fahrenheit freezing point is \_\_\_\_\_ degrees

Fahrenheit boiling point is \_\_\_\_\_ degrees

The Centigrade scale is divided into \_\_\_\_\_ degrees

Centigrade freezing point is \_\_\_\_\_ degrees

Centigrade boiling point is \_\_\_\_\_ degrees

Change  $170^{\circ}$  Fahrenheit to CentigradeAnswerChange  $60^{\circ}$  Centigrade to FahrenheitAnswer

MATHEMATICS QUIZ NO. 16

NAME \_\_\_\_\_

The Apothecary System of Measuring

1. 60 minimis \_\_\_\_\_ fluidrams

8 fluidrams \_\_\_\_\_ fluidounces

16 fluidounces \_\_\_\_\_ pints

2 pints \_\_\_\_\_ quarts

4 quarts \_\_\_\_\_ gallons

2. Change 3 pints to fluidounces \_\_\_\_\_.

Change 3 pints to fluidrams \_\_\_\_\_.

Change 1 gallon to fluidrams \_\_\_\_\_.

Change 4 fluidrams to minimis \_\_\_\_\_.

Change 200 minimis to fluidrams \_\_\_\_\_.

3. Write the symbol for fluidram \_\_\_\_\_.

Write the symbol for fluidounce \_\_\_\_\_.

Write the symbol for scruplo \_\_\_\_\_.

Write the symbol for one half \_\_\_\_\_.

4. What is the official system for measuring used in the army?

## MATHEMATICS QUIZ NO. 7

NAME \_\_\_\_\_

The Metric System

The unit of length is called a \_\_\_\_\_.

The unit of weight is called the \_\_\_\_\_.

The unit of capacity is called the \_\_\_\_\_.

The prefix deka means \_\_\_\_\_.

The prefix milli means \_\_\_\_\_.

The prefix kilo means \_\_\_\_\_.

The prefix centi means \_\_\_\_\_.

The prefix deci means \_\_\_\_\_.

The prefix hecta means \_\_\_\_\_.

A kilogram is equal to \_\_\_\_\_ pounds.

Change 160 pounds to kilograms \_\_\_\_\_.

Change 87 kilograms to pounds \_\_\_\_\_.

How many grains in a gram? \_\_\_\_\_.

A grain is what part of a gram? \_\_\_\_\_.

MATHEMATICS QUIZ NO. 8

NAME \_\_\_\_\_

1. Make 800cc. of 2% solution from a 40% solution.

2. Make 1500cc. of a 1:500 solution from pure crystals.

3. Make 4000cc. of a 1:80 solution from tablets containing 2 gms.  
(Pure drug).

PERIOD	HOURS	WEEK	SUBJECT
1	1	1	Steps of Evacuation; First and Second Echelons of Medical Service; The Clearing Station.
2	1	1	Second, Third, Fourth, and Fifth Echelons of Medical Service.
2	2		TOTAL

1. Purpose and Scope: To acquaint the enlisted man with the mission of the Medical Department and its function as part of the Army of the United States. To give the enlisted man an idea of the organization of the Medical Department and its several component corps of specialists. To explain the echelons of the Medical Service and the reasons for their existence, with the type of units to be found therein.

2. Standards of Proficiency: The enlisted man will know:

- a. Mission of the Medical Department.
- b. The five steps of evacuation.
- c. How and why a man is evacuated.
- d. A broad concept of the general plan for evacuation of the wounded in a theater of operation.
- e. To understand the organization and function of units within the five steps of evacuation and the services rendered by these units.

3. Basic References: FM 8-5.

First Period - One Hour

Steps of Evacuation; First and Second Echelons of Medical Service; The Clearing Station

Place: Classroom

References: FM 7-30, Chap 4, 7; FM 8-5, Chap 2; FM 8-10, Chap 2, Sec II

Instructional Aids:

Personnel: None

Equipment: Display chart showing Plan of Evacuation of Wounded  
Display chart showing Organization of Regimental  
Medical Detachment  
Display chart showing First Echelon of Evacuation

Individual Equipment: Notebook and pencil

1st Hour - Conference

Points to be Covered

1. Explain the term "evacuation."

2. Problems of evacuation.

a. The withdrawal must be made against a constant forward flow of troops and supplies, and interference must be kept to a minimum.

b. Evacuees are unorganized. They are not self-supporting but require individual care and treatment through all stages of their withdrawal.

c. In forward areas specifically, evacuation must be carried on at times under difficult conditions of weather, terrain, and combat.

3. The chain of evacuation. Use the display board. Point out how the casualties, wounded near the front line, are evacuated.

a. Company aid men with companies at the front treat the men.

b. Litter bearers carry him to the aid station.

c. A medical officer assisted by enlisted men of the Medical Department treats the man at the battalion aid station.

d. The casualty is transported by collecting company litter bearers to the collecting station.

e. The casualty is further treated by medical officers and enlisted men of the collecting station.

f. The man is now transported by ambulance of the same collecting station to the clearing station.

g. At clearing station he receives further treatment. All through this chain of evacuation, attempts are made to return this man to his organization if his condition does not warrant further evacuation.

h. Ambulances from separate ambulance companies in convoy

now transport the casualty from the clearing station to the evacuation hospital.

i. Casualty is now moved by ambulance convoy, by transport plane, by ship, or by railroad to a general hospital or a hospital center.

j. If the casualty requires prolonged hospitalization, he will be evacuated by hospital ship or transport plane to a named general hospital in the United States.

4. The relation of the Medical Detachment to the regiment.

5. Outline the organization and function of the medical detachment of the infantry regiment.

a. Headquarters section.

b. Battalion medical sections.

(1) Battalion aid station group.

(a) Discuss the aid station, its location, and function.

(2) Company aid group.

(a) Describe briefly the duties of the company aid men.

(3) Litter bearer groups.

(a) Describe the duties of the litter bearer squads.

6. Brief discussion of other detachments to emphasize that all units the size of a battalion or larger, except medical, will have their detachments.

7. Review the mission of the Medical Department.

a. Explain the general responsibilities of the Regimental Medical Detachment in fulfilling its portion of the mission.

8. Organization of the Medical Battalion (briefly)

9. Discuss the Collecting Company and its component parts with reference to:

a. Organization

b. Function; Contact, evacuate, treat, transport.

- (1) Liaison Section
- (2) Litter Bearer Section
- (3) Station Platoon
- (4) Ambulance Platoon

c. Relations with other units.

- (1) Regimental Medical Detachment
- (2) Clearing Station

d. Explain the ambulance shuttle system.

10. Discuss briefly the Headquarters and Headquarters Detachment, Medical Battalion, with reference to:

- a. Organization
- b. Function
- c. Relations with collecting and clearing companies

11. Discuss the Clearing Company, Medical Battalion, with reference to:

- a. General Function of clearing elements.
- b. Organization of Clearing Company.
- c. Organization and function of Company Headquarters.
- d. Organization and function of Clearing Platoon.
- e. Employment and transportation of Clearing Company.
- f. Location of Clearing Station.

(1) Position of chain of evacuation.

(2) Desirable and undesirable features for locating Clearing Station.

g. Arrangement of Clearing Station.

- (1) Under conditions where the enemy respects the Geneva Red Cross.
- (2) Under conditions where it is necessary to employ concealment and camouflage.

Second Period - One Hour

Third, Fourth, and Fifth Echelons of Medical Service

Place: Classroom

References: FM 8-5, Chapter 9, 17; TM 8-260

Instructional Aids:

Personnel: Projectionist

Equipment: Display chart showing Plan of Evacuation from Division Area to and including the ZI  
Film Bulletin #132  
Projector

Individual Equipment: Notebook and pencil

2d Hour - Conference

Points to be Covered

1. Brief review of how a casualty is evacuated from the front lines through the various medical installations to the Clearing Station. (First and second steps in the chain of evacuation).
2. Function and employment of the evacuation hospital.
  - a. Third step in the chain of evacuation.
  - b. Where the hospital is employed.
  - c. A mobile unit.
  - d. Concept of size and capacity.
  - e. Controlled by Army.
3. Function and employment of the regulating station and all hospitals in the Communications Zone.
  - a. Fourth step in the chain of evacuation.
  - b. Where the various installations are employed.
  - c. Concept of size and capacity, briefly.
4. Named General Hospitals.
  - a. Fifth step in chain of evacuation.
    - (1) Terminus in evacuation.
    - b. Located in the United States.
5. Introduce Film Bulletin #132 (Evacuation of Wounded).
6. Show Film. (15 minutes)
7. Summary and questions.



## PHYSICAL TRAINING

(11)

### 1. Program:

a. The program has been divided into the following phases:

#### (1) Conditioning Phase:

(a) This phase will be instructional in nature and will be directed towards improving the physical standards of the individual through his participation. This phase will include such activities as coordination and conditioning exercises, physical contact sports, gymnastics, obstacle courses, swimming, boxing, and wrestling.

#### (2) Athletic Phase:

(a) This phase will be correlated with the Conditioning Phase and will stress through competitive application of the fundamentals and techniques taught therein. This phase will include individual competitive sports and intramural leagues.

### 2. Purpose:

a. To raise and maintain the physical standards of the organization.

b. To develop and maintain a high level of all-around physical fitness in the individual so that he may more readily assimilate instruction and better attain the training objectives.

c. To encourage regular and healthful exercise by the development of appropriate skills, techniques, and attitudes.

d. To foster an aggressive and cooperative team spirit, to increase the confidence of the individual, to develop sportsmanship, and to increase unit pride through participation in vigorous competitive athletics.

### 3. Scope:

a. To include general conditioning activities as well as instruction and participation in a wide variety of athletic sports.

b. To be adjustable to the needs and capabilities of the individual, and to provide for a gradual increase in the intensity of training as the physical condition of the men improves.

4. Training Notes:

a. Conditioning exercise drills will be conducted as prescribed in Par 49, Sec III, Chap 4, FM 21-20.

b. The proper number of repetitions to be given for each four or eight count conditioning exercise is as follows:

<u>Week of Training</u>	<u>Number of Repetitions</u>
1	5
2	6
3	7
4	8
5	9
6	10
7	10
8	10

c. Moderation and progressiveness will be practical throughout the initial periods of the program.

d. Sufficient time has been allocated to each period of conditioning exercise drills to complete the series prescribed except during the initial periods when further explanation may be desired and of necessity.

e. Cross country running will be incorporated into the conditioning exercise drills.

f. Prior to troops running the obstacle course in its entirety, they will be taken over to each obstacle in turn and instructed in the proper technique of negotiating each obstacle.

g. Troops whose physical limitations or average level of physical fitness prevent them from satisfactorily completing the exercises or actively participating in sports activities will be segregated and given as much training as compatible with their physical limitations.

h. To obtain maximum benefit and supervision, physical training when practicable, will be conducted at a platoon level. Exercises included in each period will be studied and mastered by trainer personnel prior to the class.

i. Physical fitness tests will be conducted as outlined in Chapter 17, FM 21-20.

j. "Warm-Up Drills" will be conducted as outlined in Par 48, Sec II, Chap 4, FM 21-20. Coordination Exercises, as illustrated in TF 21-1466, and as outlined in Pars 49-50, Sec III, Chap 4, FM 21-20, are invaluable exercises to be used as an alternate to Warm-Up Drill.

5. Supplementary Programs:

a. Competitive athletics consisting of vigorous sports and games will be aggressively stressed. The following sports are justified in terms of the contribution they make to the Conditioning Phase (muscular development and coordination):

Pushball  
Field Handball  
Speedball  
Cageball  
Swimming  
Touch Football  
Box Basketball  
Soccer  
Boxing  
Wrestling  
Gymnastics

b. Participation in supplementary voluntary sports will complement the Conditioning Phase. (Instruction in athletic skills and techniques, intramural athletics and individual sports competition).

Basketball  
Softball  
Volleyball  
Horseshoes  
Tennis  
Table Tennis  
Golf  
Badminton  
Archery  
Baseball  
Football  
Track and Field

6. References: FM 21-20; TM 21-205; TM 21-220; TM 21-221; WDTC No. 7, dated 10 July 1946.

PERIOD	HOURS	WEEK	SUBJECT	MINUTES
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FIRST WEEK

1	2	1	Introductory conference to Physical Training Program, emphasizing the importance of physical fitness to a soldier and the efficiency benefits to be derived through vigorous, wholehearted, active participation. Short introduction to Training Film.	25
			Showing of TF 21-1466	15
			Discussion of Training Film	10
			March to Drill Field	10
			Warm-Up Drill	10
			Ref: Par 48, Sec II, Ch 4, FM 21-20	
			*Conditioning Exercise Drills	30
			Stress proper explanation and demonstration of exercises by instructors during preliminary stages of instruction and "on the spot corrections."	
2	1	1	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20	10
			*Conditioning Exercise Drills	40
3	2	1	Physical Fitness Test To be administered as outlined in "Training Notes," Par 4i of this Lesson Plan. Ref: Ch 17, FM 21-20	100

SECOND WEEK

4	1	2	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20	10
			*Conditioning Exercise Drills	40
5	1	2	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20	10
			*Conditioning Exercise Drills	40
6	1	2	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20	10
			*Conditioning Exercise Drills	40

PERIOD	HOURS	WEEK	SUBJECT	MINUTES
7	1	2	Obstacle Course Refer to "Training Notes," Par 4f, this Lesson Plan	50
8	1	2	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20 *Conditioning Exercise Drills	10 40

## THIRD WEEK

9	1	3	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20 *Conditioning Exercise Drills Grass Drills Ref: Par 75, Sec III, Ch 9, FM 21-20	10 30 10
10	1	3	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20 *Conditioning Exercise Drills Guerrilla Exercises To be conducted as outlined in Ch 8, FM 21-20	10 30 10
11	1	3	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20 *Conditioning Exercise Drills Grass Drills Ref: Par 75, Sec III, Ch 9, FM 21-20 Guerrilla Exercises Ref: Ch 8, FM 21-20	10 30 5 5
12	1	3	Obstacle Course	50
13	1	3	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20 Combative Contests: (a) Rooster Fight Ref: Par 96a(12), Sec I, Ch 13, FM 21-20 (b) Indian Wrestling Ref: Par 96a(20), Sec I, Ch 13, FM 21-20 (c) Horse and Rider Fights Ref: Par 96b(7), Sec I, Ch 13, FM 21-20	10 10 10

PERIOD	HOURS	WEEK	SUBJECT	MINUTES
13	1	3	Combative Contests contd (d) Cross Country Running	10

FOURTH WEEK

14	1	4	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20 *Conditioning Exercise Drills Grass Drills Ref: Par 75, Sec III, Ch 9, FM 21-20 Guerrilla Exercises Ref: Ch 8, FM 21-20	10 20 10 10
15	1	4	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20 *Conditioning Exercise Drills Hand-Wrestling To be conducted on a competitive basis; first, squad competition be held to decide the squad winners; second, competition between the squad winners to decide the platoon champions; and finally, the company champion will be picked through competition between the platoon winners. Ref: Par 96a(18), Sec I, Ch 13, FM 21-20	10 15 25
16	1	4	Obstacle Course	50
17	1	4	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20 *Conditioning Exercise Drills Guerrilla Exercises Ref: Ch 8, FM 21-20 Grass Drills Ref: Par 75, Sec III, Ch 9, FM 21-20 Cross Country Running	10 20 5 5 10
18	1	4	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20 *Conditioning Exercise Drills Wrestling Ref: Sec II, Ch 13, FM 21-20	10 20 20

PERIOD	HOURS	WEEK	SUBJECT	MINUTES
FIFTH WEEK				
19	2	5	Physical Fitness Test To be administered as outlined in "Training Notes," Par 4i of this Lesson Plan. Ref: Ch 17, FM 21-20	100
20	1	5	Obstacle Course	50
21	1	5	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20 *Conditioning Exercise Drills Touch Football Between Squads The winning squad in each game will be noted for reference at a later date. Assigned company personnel will officiate games.	10 15 25
22	1	5	Touch Football The winning squads in the previous Physical Training hour from each platoon will play a 20-minute game to decide platoon winners. During this period, teams from the losing squads in each platoon will also play. Any men not being used to play on teams will be used for substitutions. Assigned company personnel will officiate the games. A ten (10) minute break will be called following these games. After the break, the win- ning teams from the platoons will play a 20-minute game, with as- signed company personnel officiat- ing. The winners will be noted for reference at a future date. During this time, any remaining platoon teams will practice.	50

## SIXTH WEEK

PERIOD	HOURS	WEEK	SUBJECTS	MINUTES
23	1	6	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20 *Conditioning Exercise Drills Prepare for Touch Football Game Touch Football The winning teams in the previous Physical Training hour will play to decide the championship squad in the company. Assigned company personnel will officiate the game.	10 15 5 20
24	2	6	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20 *Conditioning Exercise Drills Organized Games Will include "Bull in Ring," "Ring Push," "Line Charging," and "Sitting Push Out of Circle;" all as outlined in Par 96b, Sec I, Ch 13, FM 21-20 Cross Country Running	10 20 60
25	1	6	Obstacle Course Time each man as he completes the course. Later, average the time for each platoon to find which platoon is "Champ of the Obstacle Course."	50
26	1	6	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20 *Conditioning Exercise Drills Softball games between squads for the purpose of segregating best players in each platoon to form platoon softball teams.	10 20

#### SEVENTH WEEK

27	1	7	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20 *Conditioning Exercise Drills Softball games between men in platoons --the men in each platoon are to be	10 15 25
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PERIOD	HOURS	WEEK	SUBJECT	MINUTES
27	1	7	Softball games contd divided into four teams; best, second best, third best, and fourth best. These will be called "1st," "2s," "3d," and "4th" teams, respectively. The 1st team will play the 2d; and the 3d team will play the 4th, in each platoon.	
28	2	7	Softball The best teams will play 4-inning games to decide the company championship softball team. Assigned company personnel will officiate all games. Men not participating in the softball games may either watch the games to root for their teams or play other games, such as volleyball, basketball, football, boxing, and wrestling.	100
29	1	7	Obstacle Course All men will run the course for time. At a later date the mens' time will be posted on the Company Bulletin Board in the order of the fastest men first so that the men can see how they rate with the rest of the company. A duplicate copy of this tabulation will be furnished to Training Division, MDETS.	50
30	1	7	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20 *Conditioning Exercise Drills Grass Drills Ref: Par 75, Sec III, Ch 9, FM 21-20 Guerrilla Exercises Ref: Ch 8, FM 21-20 Cross Country Running	10 20 5 20 5 10

PERIOD	HOURS	WEEK	SUBJECT	MINUTES
31	1	8	Warm-Up Drill Ref: Par 48, Sec II, Ch 4, FM 21-20 *Conditioning Exercise Drills Volleyball To be played between squads.	10 15 25
32	1	8	Obstacle Course	50
33	1	8	Relay Race Meet The unit of competition will be the squad. Races will be "heelbarrow Race," "Horse and Rider Relay," "Two-legged Race," "Caterpillar Race," and "Fireman's Carry Relay." All will be conducted as outlined in Par 93, Ch 12, FM 21-20. <u>Scoring:</u> The first squad to finish each event will be given a score equal to the number of squad competing. The second squad to finish will get a score equal to the number of squads competing minus one, and on down until the last squad to finish an event will get a score of one. <u>Example:</u> If twelve squads compete, scores will be computed by giving the first squad to finish a score of 12, the second to finish a score of 11, the third to finish a score of 10, and so forth. The scores for all races will be totaled, and the squad with the highest score when all the races are completed wins the meet.	50
34	2	8	Physical Fitness Test To be administered as outlined in "Training Notes," Par 4i of this Lesson Plan. Ref: Ch 17, FM 21-20	100
34	40		TOTAL	

\* Refer to "Training Notes," Par 4a, b, c, and d of this Lesson Plan for proper number of repetitions of each exercise, and for references.

PERIOD	HOURS	WEEK	SUBJECT
1	1	6	Introduction to Public Property
2	1	6	Property Accountability and Responsibility
3	2	7	Expendable and Nonexpendable Supplies
4	1	7	Ward Supplies
4	5		<b>TOTAL</b>

1. Purpose and Scope: The purpose of this course is to enable the student to identify and use the correct terminology in reference to supplies, to know how to order and transfer property, and to understand accountability and responsibility for public property. The course will include instruction in property accountability and responsibility, expendable and nonexpendable items, standard and non-standard items, the Medical Department Supply Catalogue, the use of WD AGO forms, disposition of lost, destroyed or damaged property, and ward supplies.

2. Standard of Proficiency: At the completion of the course each student should:

- a. Have a working knowledge of how property is handled in the Army.
- b. Know his responsibilities as a soldier in the Medical Department in the care and use of public property.
- c. Be familiar with terminology used in reference to supplies.
- d. Be sufficiently familiar with the Medical Department Supply Catalogue, to use it in ordering ward supplies.

3. Basic References: TM 8-220; Medical Department Supply Catalogue.

First Period - One Hour  
Introduction to Public Property

Place: Classroom

Reference: TM 8-220, par 308-309

Instructional Aids:

Personnel: One man to lecture

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

1st Hour - Lecture

Points to be Covered

1. Definition: Public Property is property belonging to or in use by the Government.

2. General Rules in handling Public Property:

a. Careful standardization of supply methods is necessary to supply all units of the Army with every article of equipment and supply at the precise time and place needed.

b. Waste and extravagant use of supplies must be avoided. All Medical Department personnel must see that full value is derived from all public property in use. Timely repair will prolong the life of much equipment.

c. In checking property lists report surplus found so that shortages elsewhere may be made up. This is especially true of ward supplies.

d. Arrange stock so that old stock will be used first. Inspect articles which may deteriorate frequently.

e. Do not "inflate" or "pad" requisitions. Order only what you expect to need under normal conditions. Ordering more than you need clutters up your supply shelves and if limited quantities only are available it may deprive someone else who needs the supplies more than you do. Emergency requisitions may be submitted to meet unforeseen requirements.

3. Explanation of terms:

a. Accountability: Duty of an officer or other person for keeping an accurate record of public property or funds. The person having this duty may or may not have actual possession of the property or funds.

b. Responsibility: Duty of a person who has possession of public property to keep it in good condition. "Responsible" persons are not required to keep a stock record account. They may have the property on a "Memorandum Receipt" from a supply officer who is

accountable. If a responsible person fails to produce the property or if the property is damaged or destroyed through negligence he is financially liable.

c. Expendable property: Property that is consumed or loses its identity in use; non-recoverable property. Examples: Stationary supplies, ammunition, etc. Expendable property is dropped from stock record accounts when it is issued or used.

d. Nonexpendable property: Supplies that do not lose their identity in use. Such supplies may reasonably be expected to wear out in time. Examples: Tables, beds, etc.

e. Standard supplies: Items of supplies that have been accepted for general army use. These will be found listed in the various catalogues.

f. Non-standard supplies: Articles not listed in the supply catalogues that are purchased locally or are obtained by requisitions when needed.

Training Notes:

1. Stress general rules in handling public property.

Second Period - One Hour  
Property Accountability and Responsibility

Place: Classroom

Reference: TM 8-220, par 319, 322, 323

Instructional Aids:

Personnel: One man to lecture

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

2d Hour - Lecture

Points to be Covered

1. Definitions reviewed:

a. Accountability: Duty of an officer or other person for keeping an accurate record of public property or funds. He may or may not have actual possession of the property or funds, but must maintain a stock record account thereof.

b. Responsibility: Duty of a person holding property on Memorandum Receipt to keep said property in good condition. If property held by Memorandum Receipt is lost, damaged or destroyed through negligence the person is financially liable.

2. Transfer of property accountability and responsibility:

a. Public property is normally transferred through the medium of Property Issue Slips (WD AGO Form 446). In this way property accountability is transferred to the receiving person. The Property Issue Slips are made out in duplicate. One copy is received by the receiving officer and returned to the transferring officer. The other copy is filed by the receiving officer as a voucher to his stock record account.

b. Transfer of property on Memorandum Receipt makes the receiving person responsible but not accountable. For example: the Supply Officer in an army hospital is usually accountable for all equipment in that hospital. He must have an accurate stock record account. The Ward Officer on a ward signs a Memorandum Receipt for the equipment on his ward; this makes the Ward Officer responsible but the Supply Officer is still accountable.

3. Disposition of lost, destroyed or damaged property:

a. A person responsible for public property is charged for any loss or destruction of, or damage to, property for which he is responsible unless relieved from responsibility through an approved report of survey or in other manner in accordance with regulations.

b. Stoppages against enlisted men after due procedure are entered on the pay roll, and the enlisted man when signing the pay roll is informed that his signature will acknowledge the justice of the charge. He is also to be advised on his right to demand a survey and the approved recommendation of the surveying officer will be final.

c. A person can be held financially liable for loss, destruction of, or damage to, public property whether or not he signed a Memorandum Receipt if report of survey proves such loss, destruction or damage was due to his negligence.

Training Notes:

1. Stress the difference between accountability and responsibility.
2. Stress financial liability in cases of negligence.
3. Explain "report of survey."

Third Period - Two Hours  
Expendable and Nonexpendable Supplies

Place: Classroom

References: TM 8-220, par 313, 315, 316; MD Supply Catalogue

Instructional Aids:

Personnel: One man to lecture

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

3d and 4th Hours - Lecture

Points to be Covered

1. Expendable property consists of those items which are consumed in the maintenance and upkeep of the military establishment. Expendable items are designated by an X in the appropriate column of the Medical Department Supply Catalogue. When expendable items are issued for use they are dropped from stock record account of the accountable officer. Each supply branch determines which items issued by it shall be classed as expendable.

2. Nonexpendable property comprises all other articles of public property. Such articles can be dropped from the property account only through the medium of Property Issue Slip, approved report of survey, and approved inspection and inventory reports.

3. The Medical Department Supply Catalogue lists those items the issue of which is the responsibility of the Medical Department.

a. Standard medical supplies are all those listed in the Supply Catalogue while non-standard medical supplies are those not listed but procured by the Medical Department as required.

b. Classes of standard medical supplies:

- (1) Class 1: Drugs, chemicals
- (2) Class 2: Surgical dressings
- (3) Class 3: Surgical instruments
- (4) Class 4: Laboratory equipment and supplies
- (5) Class 5: Dental equipment and supplies
- (6) Class 6: X-Ray equipment and supplies
- (7) Class 7: Furniture
- (8) Class 8: Veterinary equipment and supplies
- (9) Class 9: Field equipment and supplies

c. The classification, nomenclature, and item numbers listed in the Medical Department Supply Catalogue are used in the preparation of all papers pertaining standard medical items.

d. Separate requisitions are submitted for non-standard items. These items are listed alphabetically and by class, and each must be followed by a brief description of the item or the manufactured catalogue number, name, and address.

4. WD AGO Forms used for public property:

a. WD AGO Form #446 and WD AGO Form #446-A are the Property Issue sheets and extra sheet. These forms are used for issue of expendable and nonexpendable items. Separate issue slips will be made for expendable items.

b. WD AGO Form #447 is the Property Turn-in slip utilized to turn in excess, serviceable, Memorandum Receipt, and unserviceable property. It is yellow in color to distinguish it.

c. WD AGO Form #36 is used for statement of charges initiated by the unit supply officer when enlisted persons of their own volition admit liability for loss, damage, or destruction of public property. If an enlisted man declines to admit liability or the amount of the charge is in excess of one hundred dollars a report of survey is initiated. The responsible officer is the person who initiates the report of survey.

d. WD AGO Form #15 is used for report of survey. This report is used whenever loss or destruction of, or damage to public property occurs. It is submitted to the Commanding Officer who, if satisfied the best interest of parties concerned are so served, may approve the report as submitted. The report thus approved or an acceptable voucher for determining accountability is required.

Training Notes:

1. Emphasize proper use of Medical Department Supply Catalogue.
2. Emphasize that separate requisitions are required for expendable and nonexpendable supplies.
3. Emphasize WD AGO Forms and their use.

Fourth Period - One Hour  
Ward Supplies

Place: Classroom

Reference: TM 8-220, par 308-324

Instructional Aids:

Personnel: One man to lecture

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

5th Hour - Lecture

Points to be Covered

1. Accountability and responsibility of ward supplies:

a. In most general and station hospitals the Supply Officer of the hospital is accountable for all supplies in all departments of the hospital. His stock record accounts show where every item of equipment is located and the Memorandum Receipts he has in his files show who is responsible for such equipment. He is responsible only for equipment not signed by on a Memorandum Receipt.

b. The Ward Officer is usually responsible for the equipment on his ward. In some hospitals the wards are combined in sections and one officer is responsible for the equipment in the entire section. The responsible officer signs a Memorandum Receipt (MR) which relieves the Supply Officer of responsibility.

c. All personnel who use the public property on a ward are in part responsible in that any loss, damage or destruction to such property if proven to be due to the negligence of an individual makes him financially liable.

2. Inventory of ward supplies:

a. The accountable officer is required to make an inventory, in person, at least once a year of all property for which he is accountable, except that held on Memorandum Receipt.

b. Responsible officers (those holding property on Memorandum Receipt) are required to inventory such property every six months or more often if the Commanding Officer requires it. Responsible officers on wards usually desire to check the inventory with the wardmaster once a month.

c. In each case where the inventory balance does not agree with the stock record balance the necessary vouchers such as over, short, and damage reports and reports of survey are prepared.

3. Expendable items of ward supply:

a. Expendable items are usually ordered weekly by the wards. Only the amount normally expected to be used for the coming week should be ordered. Emergency requisitions may be used for supplies to meet unforeseen needs.

b. Supplies in excess on a ward:

- (1) Make inventory more difficult.
- (2) Load the supply shelves and make them more difficult to keep neat and clean.
- (3) Show poor management in not being able to more accurately anticipate the needs.
- (4) May deprive another ward of needed supplies if there is a limited quantity.

c. Weekly supply orders for expendable items on a ward are usually made out by the wardmaster and checked by the charge nurse of the ward. Expendable items must be ordered separately from nonexpendable items. The classification, nomenclature and item numbers listed in the Medical Department Supply Catalogue are used. The item numbers must be in order with the smallest number first.

4. Transfer of property on the wards:

a. Nonexpendable property can normally be transferred only through the medium of Property Issue slips.

b. Property should never be moved from one ward to another without property transfer on records so that the responsible officer is relieved of his responsibility and the accountable officer (Supply Officer) can account for the property on his records.

5. General rules regarding ward supplies:

a. The wardmaster usually makes frequent unofficial checks of nonexpendable items as a safeguard against their loss.

b. Loss of property must be guarded against in transferring patients to another ward or taking patients to another department for pillows, etc must be returned to the ward or a receipt obtained for them.

c. Loss of linen supplies must be guarded against in exchanging dirty for clean linen.

Training Notes:

1. Stress the role of the enlisted man in relation to ward supplies.

TROOP INFORMATION PROGRAM

(13)

PERIOD	HOURS	WEEK	SUBJECT
1	1	1	I & E - Indoctrination
2	1	2	The True Glory (Part I)
3	1	3	The True Glory (Part II)
4	1	4	Value of Military Training in Later Jobs
5	1	5	The Three "Rs" to World Peace
6	1	6	The G.I. Bill
7	1	7	One World or None
8	1	8	Why is Discipline Necessary in the Army
8	8		TOTAL

1. Purpose and Scope: To inform the soldier on matters of significance to him in connection with his military duties, to afford a source of general information in order that he may understand and evaluate his responsibilities as a soldier and a citizen, and to provide an opportunity for free discussion with his fellows on these topics.

2. Standard of Proficiency: The American soldier should be the best informed in any army and realize the important role he plays in world affairs.

3. Basic References: WD Circulars 360, 1944; 392, 1944; 18, 1946; and 100, 1946; TM 8-210.

4. Training Notes:

a. All officers, cadre, and students will be required to attend one (1) hour of TIP weekly.

b. Troop Information Programs will be supplemented by off-duty discussion periods.

c. Sources of information will be made available through the I & E Branch, Training Division.

d. Troops will be currently informed of news during first ten (10) minutes of each Troop Information class.

PERIOD	HOURS	WEEK	SUBJECT
1	2	1	Military Hospitals in the United States
2	1	2	Ward Personnel and Their Duties
3	1	7	Visitors; Disposal of Patients' Property and Valuables
4	1	7	Procedure Before and After Death
5	1	7	Ward Records
6	1	8	Ward Records
7	1	8	Care of Instruments
7	8		TOTAL

1. Purpose and Scope: The purpose of this course is to give the student a basic knowledge of the organization and administration of a military hospital. The course should include duties of military and civilians in a hospital who make up the personnel of a ward; visitors and visiting hours; disposal of patient's property and valuables; procedure for placing a patient on seriously ill list and procedure following death; the principles, purpose, and importance of medical records emphasizing ward records; the responsibilities of ward personnel in connection with care and sterilization of instruments.

2. Standard of Proficiency: At the completion of the course each student should:

- a. Be familiar with the organization and administration of a military hospital
- b. Be familiar with the duties and responsibilities of all personnel on a ward.
- c. Know the importance of medical records and have a practical understanding of such records.

3. Basic References: TM 8-260; TM 8-262; TM 8-220; WD Circular 349, dated 28 November 1946.

First Period - Two Hours  
Military Hospitals in the United States

Place: Classroom

References: TM 8-260, Ch 1, 2, 3; TM 8-262; WD Circular 349, dated 28 November 1946

Instructional Aids:

Personnel: One officer to act as lecturer

Equipment: Blackboard and non-standard diagram of ward

Individual Equipment: Notebook and pencil; one non-standard diagram of ward per student

1st & 2d Hours - Lecture

Points to be Covered:

1. Types of hospitals

a. Station

- (1) Name: Title of camp at which located.
- (2) Function: To care for troops from the station to which it pertains.

b. General

- (1) Name: For distinguished deceased medical personnel.
- (2) Function: To serve general and special needs.
- (3) Purpose:
  - (a) Afford better facilities.
  - (b) Better performance of more difficult surgical operations.
  - (c) Disposition of cases hospitalized over long periods of time.
  - (d) Receive and give definitive treatment to patients from other hospitals.

2. Organization of the general or station hospital

a. Commanding Officer

- (1) Responsible for administration of hospital.
- (2) Responsible for care of patients.

b. Administrative Staff Division

(1) Executive Officer

- (a) Coordination of all activities of the hospital.
- (b) Carry out policies of the Commanding Officer.

(2) Adjutant

- (a) Responsible for all incoming and outgoing correspondence, orders, and circulars.
- (b) General control of all hospital records. Issues all orders "By Order of the Commanding Officer."
- (c) Operates information office.

(3) Medical Supply Officer

- (a) Procurement, storage, issue and maintenance of all medical supplies in the hospital.

(4) Personnel Section

- (a) Duties: Administration of all personnel matters except those retained by medical detachment and the detachment of patients.

(b) Types:

- 1. Civilian
- 2. Military

(5) Registrar

- (a) In charge of reports and records of patients.
- (b) All matters pertaining to death.
- (c) In charge of patients fund.

(6) Dietetic Division

- (a) Administration of hospital messes.
- (b) Custodian of hospital subsistence account.

(7) Detachment of Patients Branch

- (a) Immediate command over all patients.
- (b) Operates patients baggage and clothing rooms.

(8) Medical Detachment

- (a) Enlisted men and WAC - separate CO
- (b) Duties:

1. Immediate command over enlisted personnel.
2. Responsible for discipline, training, equipment, uniforms, and quartering of personnel.
3. Assignment of enlisted personnel:
  - a. To administrative service.
  - b. To professional service.

(9) Admission and Disposition Branch

- (a) Responsible for the admission and disposition of all patients to and from the hospital.

(10) Chaplain

- (a) Care of religious and personal problems

(11) Hospital Inspector: Acts as medical inspector of the hospital.

- (a) Routine and special inspections.
- (b) Monthly check of alcoholic and narcotic supplies and records.

(12) A.O.D.: Assumes the duties of the administrative staff when off duty; tour of duty is 24 hours.

(13) Utilities: Under Quartermaster. Responsible for repair and upkeep of electricity, plumbing, etc.

c. Professional

(1) Nursing service

- (a) Provides nursing service for the hospital.
- (b) Assists in the technical training of nurses.
- (c) Supervises nurses quarters.

(2) Surgical service

- (a) Furnishes treatment for all patients assigned or referred to the service.
- (b) Operates operating section, anesthesia section, EENT section, and other clinics.
- (c) Operates all assigned wards:

1. General surgery
2. Septic surgery
3. Urology
4. Orthopedic
5. Others

## (3) Medical service

- (a) Furnishes treatment for all patients assigned or referred to the service.
- (b) Operates all assigned wards:

1. General medicine
2. Communicable diseases
3. Dermatology
4. Others

- (c) Supervises medical library

## (4) Neuropsychiatry service

- (a) Furnishes treatment for all patients assigned or referred to the service.
- (b) Operates all assigned wards.

## (5) X-Ray service

## (6) Dental service

## (7) Laboratory service

- (a) Examines pathological specimens
- (b) Performs autopsies
- (c) Maintains list of blood donors

## (8) Physical medicine service

- (a) Occupational therapy section
- (b) Physical therapy section
- (c) Physical reconditioning section

## 3. Physical set up of ward

a. Explanation of ward: 30 to 50 or more patient units and necessary rooms for equipment, etc., needed for the care of patients.

- (1) Standard ward: See attached diagram (diagram given each student)
- (2) Combination ward: Similar to standard; less beds in ward; private rooms with bath
- (3) Miscellaneous wards: Arranged according to physical set-up of hospital.

## b. Explanation of diagram of ward

- (1) Nurses office

- (2) Desk

- (b) Telephone
- (c) Ward Roster: A list of patients with their room or bed numbers, usually arranged according to diagram of ward.
- (d) Chart Rack: For patients' charts or histories.

(2) Clothing room

- (a) Cubicles or hangers for individual patient's clothing.
- (b) To be kept locked at all times; never give key to patients.
- (c) In hospitals with central clothing room, may be used for supplies, office space, etc.

(3) Ward kitchen: Explained in detail in Diet and Trays class.

(4) Patients' Latrine: Wardmaster responsible for appearance at all times.

(5) Treatment Room:

- (a) Medicine closet - kept locked.
- (b) Dressing cart - portable cart used for changing dressings on ward.
- (c) Examining table - used for examinations and major treatments.
- (d) Chairs
- (e) Closet for supplies - extra adhesive, bandages, sterile supplies, etc.

(6) Doctor's Office

(7) Clean Linen Room (explained in linen class)

(8) Nurses' Latrine: Door opens into linen room (#7)

(9) Soiled Linen Cupboard: For soiled linen only. Linen to be kept in hamper, not on floor.

(10) Utility Room:

- (a) Hopper: Large deep sink; has lever for flushing contents of bedpans, urinals, emesis basins and other contaminated equipment into hopper.
- (b) Sink: For cleaning soiled but not grossly contaminated equipment as I.V. sets, bath basins, etc.
- (c) Racks for bedpans and urinals.
- (d) Shelves for enamelwear.
- (e) Utensil sterilizer.

(11) Hallway to ward:

- (a) Fire extinguisher

- (b) Fire alarm
- (c) Hand litters - never to be locked
- (12) Ward
- (13) Enclosed porch - glassed and heated. (Used as sun parlor)
- (14) Open porch - not heated. Do not move furniture from closed to open porch.
- (15) Corridor

c. Patient Unit (see diagram)

- (1) Bedside table: on patient's right.
- (2) Pillow: open end of pillow case on patient's right, seam toward head of bed.
- (3) Bed
- (4) Patient's shoes: on patient's right at foot of bed, toes pointing out.
- (5) Chair: on patient's left at foot of bed.

Training Notes:

1. Explain duties of each section or officer in relation to the patient.
2. Stress the use of each room on the ward.
3. Emphasize the set-up of the patient unit (use diagram).

Second Period - One Hour  
Ward Personnel and Their Duties

Place: Classroom

References: TM 8-220, Ch 4; TM 8-260, Ch 2 & 3

Instructional Aids:

Personnel: One officer to act as lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

3d Hour - Lecture

Points to be Covered:

1. Chain of Command
  - a. Military personnel

- (1) Ward officer
- (2) Nurses
- (3) Wardmaster
- (4) Enlisted personnel

b. Other personnel, civilian workers and volunteers, are directly responsible to the ward officer but exercise no command.

## 2. Duties and responsibilities

### a. Ward officer - Medical officer

#### (1) General

- (a) Assigned to duty by the Chief of Service
- (b) Responsible to the Chief of Service for:
  - 1. Administration of ward
  - 2. Discipline of ward
  - 3. Care of patients
  - 4. Proper performance of duty by personnel on ward

(c) May delegate responsibility to ward nurse.

#### (2) Administration - necessary if patients are to receive the best treatment and care.

- (a) Absolute cleanliness, orderliness, and quiet on ward.
- (b) Careful thorough inspection daily.
- (c) Ward free from roaches and other insects.
- (d) Patients wear proper clothing.
- (e) Visitors - not on ward at hours other than visiting hours.

#### (3) Property

- (a) Accountable for all property on ward.
- (b) May delegate responsibility for care to other personnel.

#### (4) Patients

- (a) Examination and treatment
- (b) Order all medications and treatments
- (c) Discipline
- (d) Complaints

### b. Nurses

## (1) General

- (a) Assigned to duty by the chief nurse
- (b) Responsible to ward officer and chief nurse

## (2) Charge nurse

## (a) General

- 1. Assigned by chief nurse to serve as responsible nursing head.
- 2. Works under direction of ward officer.
- 2. Other ward personnel under her direct supervision.

## (b) Responsibilities

- 1. See that doctor's orders are carried out.
- 2. Proper administration of all medications and treatments.
- 3. Procurement of, and proper serving of food, if no dietitian is assigned.
- 4. Preparation of all ward records and routine reports.
- 5. Safeguarding keys to narcotics and liquors.
- 6. Care of ward property.
- 7. Preparation of requisitions for needed supplies.
- 8. Cleanliness and order of ward.
- 9. Nursing care of patients.

## (3) Nurses

- (a) Perform duties as assigned by charge nurse.
- (b) Assume duties of charge nurse in her absence.

## c. Enlisted personnel

## (1) General

- (a) Assigned to ward by office of professional service.
- (b) Responsible to ward officer and charge nurse.

## (2) Wardmaster

## (a) General

- 1. Assigned by professional service office as wardmaster.
- 2. Other enlisted personnel under his direct supervision.

(b) Duties

1. Responsible that all enlisted personnel assigned to ward:
  - a. Remain at their place of duty.
  - b. Are clean and neat about their person.
  - c. Are in proper uniform.
  - d. Properly perform work to which they are assigned.
2. Specifically charged with responsibility for:
  - a. Policing of ward.
  - b. Care of linens.
  - c. Moving and transporting patients.
  - d. Disposition and exchange of surplus and unserviceable property.
  - e. Securing of supplies: Medical, Drugs, and others.
2. Other duties as may be designated by ward officer or nurse.

(3) Other enlisted personnel

- (a) Perform duties as assigned by wardmaster.
- (b) Neat, clean, and in proper uniform at all times.
  1. Hospital whites
  2. Fatigues for cleaning details.
- (c) Remain at place of duty. During duty hours notify wardmaster or nurse before leaving ward.
- d. Civilian personnel
  - (1) General
    - (a) Hired by civilian personnel office
    - (b) Hired for specific duty
    - (c) Work under ward officer and charge nurse
  - (2) Duties (as specified by civilian personnel)
    - (a) Secretaries
    - (b) Nursing attendants
    - (c) Dishwashers
    - (d) Porters
    - (e) Others

## e. Volunteers

- (1) Work under ARC
- (2) Duties

- (a) Staff assistants - secretaries to nurses
- (b) Nursing aids
- (c) Gray ladies
- (d) Others

Training Notes:

1. Emphasize the chain of command of personnel on the ward.
2. Emphasize duties and responsibilities of enlisted personnel on the ward.

## Third Period - One Hour

Visitors; Disposal of Patients' Property and ValuablesPlace: ClassroomReferences: TM 8-260, Ch 2; TM 8-262, Ch 5Instructional Aids:Personnel: One officer to act as lecturerEquipment: Blackboard and chalkIndividual Equipment: Notebook and pencil; one WD AGO Form 8-111, 8-112, and 8-178 for each student4th Hour - LecturePoints to be Covered:

## 1. Visitors

## a. Visiting hours

- (1) Usually 1400 to 1600 hours and 1800 to 2000 hours in Army hospitals.

## (2) Reasons for visiting hours:

- (a) Prevent interfering with patient's treatment.
- (b) Prevent interfering with patient's routine.
- (c) Prevent interfering with patient's rest and meals.

b. Preparation for visitors

- (1) As far as possible no treatments and appointments scheduled during visiting hours.
- (2) Ward clean; free of excess equipment, bed pans, and urinals.

c. Rules for visitors

- (1) Must abide by visiting hours.
- (2) Must not bring alcoholic liquors to ward.
- (3) Must not bring in food without permission of ward personnel.

2. Clothing and baggage

a. Clothing room

- (1) Central clothing room
  - (a) Under ward officer
  - (b) Must be kept locked at all times

b. Disposition of clothing on admission

- (1) Enlisted personnel on admission to the hospital must turn all clothing except two suits of underwear, two pair of socks, cap, and shoes. Officers may check clothing if desired.

(2) Checking clothing: Patient's property slip

- (a) Each article listed with description
- (b) Made out in duplicate

1. Original to patient
2. Duplicate with clothing

(c) Signing

1. Patient
2. Person checking clothing

- (3) Labeling clothing: Each bundle or hanger labeled with the patient's property tag. Patient receives numbered stub.

c. Storage of clothing

- (1) To be stored in central clothing room

- (a) Ambulatory patients turn in clothing at receiving office.
- (b) Litter patients undressed on ward. Ward personnel take clothing to central clothing room.
- (2) To be stored on ward: All patients go to ward in uniform; clothing checked by ward personnel.

d. Baggage from trains and boats

- (1) To get baggage: Patient turns in baggage check at receiving office. Ward notified when baggage arrives.
- (2) To inventory baggage:
  - (a) Ambulatory patient inventories baggage with baggage room personnel.
  - (b) Bed patient - ward attendant inventories baggage with baggage room personnel.

e. Withdrawal of clothing and baggage

- (1) Passes and furlough: Present approved pass or furlough orders and property tag stub to clothing room.
- (2) Discharge: Present clearance slip and property tag stub to clothing room.

### 3. Valuables

- a. Custodian: Registrar is custodian of patient's fund and valuables.
- b. On admission to hospital:
  - (1) All patients asked by medical officer if they desire to deposit money or valuables.
  - (2) All patients informed by medical officer that hospital is not responsible for loss of valuables not deposited.
  - (3) Unconscious and mentally ill patients are searched by two officers and all valuables deposited for safe keeping.
- c. Deposit certificate
  - (1) Patients desiring to make deposit:
    - (a) All valuables and money listed.
    - (b) Signed by patient and medical officer.
    - (c) Duplicate copy to patient.

- (d) Original and triplicate copies turned in to registrar with ~~valuables~~. Registrar signs, keeps original copy and returns triplicate to medical officer.
- (2) Patients having no money or valuables
  - (a) Word "none" noted under appropriate heading.
  - (b) One copy signed by patient, then turned in to registrar.
- (3) Mentally or physically incapable
  - (a) Valuables removed, listed and signed for by two officers. (If attendant is present, he signs deposit slip.)
  - (b) Four copies made
    - 1. Original - registrar
    - 2. Duplicate - attendant
    - 3. Triplicate - patient's chart
    - 4. Quadruplicate - officer checking valuables

d. Deposits during hospitalization

- (1) Made by patient if ambulatory.
- (2) Made by ward officer if bed patient.

e. Withdrawal

- (1) May withdraw valuables at any time. Must be properly identified to do so.
- (2) Must withdraw all valuables before leaving hospital.

Training Notes:

1. Stress rules for visitors on the ward.

2. Emphasize care of clothing by ward personnel.

3. Emphasize hospital not responsible for valuables while they are in possession of patient.

4. Stress routine for caring for patients' valuables.

Fourth Period - One Hour  
Procedure Before and After Death

Place: Classroom

References: TM 8-260, Ch 2

Instructional Aids:

Personnel: One officer to act as lecturer

Equipment: Blackboard

Individual Equipment: Notebook and pencil; one each of forms - WD AGO 8-166, 8-167, 8-168, and 8-219, per student.

5th Hour - LecturePoints to be Covered:

1. The seriously ill patient: Any case when recovery from illness or operation is not expected or is considered doubtful.

## a. Administrative

- (1) Patient placed on seriously ill list at order of doctor.
- (2) "Report of Seriously Ill" prepared and signed by ward officer.
  - (a) Name, rank, ASN
  - (b) Diagnosis
  - (c) Name and address of nearest relative
  - (d) Religion
- (3) "Report of Seriously Ill" taken directly to Registrar. Do not send through message center.
- (4) Registrar notifies:
  - (a) Nearest relative
  - (b) Chaplain
  - (c) Red Cross
  - (d) Commanding Officer
  - (e) Information Office
- (5) Ward personnel notifies by telephone:
  - (a) Chief Nurse's Office
  - (b) Chaplain (if possible)
- (6) List of seriously ill maintained in:
  - (a) Information Office
  - (b) Registrar's Office
  - (c) Each Ward Office
- (7) To remove patient from seriously ill:

- (a) "Removal From Seriously Ill" prepared and signed by ward officer.
- (b) Sent to registrar

b. Nursing care

- (1) Carry out orders of doctor concerning medications and treatments.
- (2) Keep patient comfortable:
  - (a) Pajamas and bed dry.
  - (b) Linen free of wrinkles.
  - (c) Change position frequently.
- (3) Environment
  - (a) Room warm and well ventilated.
  - (b) Room free of excess equipment.
- (4) Nourishment (if conscious)
  - (a) Frequent small feedings.
  - (b) Variety

c. Visitors: Seriously ill patients may have visitors at any time if they do not interfere with his rest or treatment.

d. Approaching death:

- (1) Signs of:
  - (a) General slowing of circulation
    - 1. Feet and hands become cold.
    - 2. Skin pale or mottled.
    - 3. Pulse becomes weak, may be abnormally rapid or slow depending upon cause of illness.
  - (b) Muscles lose their tone - body assumes position which requires no support.
    - 1. Jaw sags.
    - 2. Cheeks sucked in and blown outward with each respiration.
    - 3. Reflexes gradually disappear.
  - (c) Respirations
    - 1. Mouth breathing.
    - 2. Noisy - "death rattle"
    - 3. Rapid and shallow or abnormally slow.

- (d) All special senses slowed.
- (e) Anxiety or distress

- 1. Restless
- 2. Pulling at bed clothing
- 3. Moaning

(2) Technician's responsibility:

- (a) Keep patient comfortable

- 1. Conserve patient's energy.
- 2. Raise head of bed to help breathing.
- 3. Keep free from mucous.
- 4. Keep bed dry.

- (b) Notify nurse of any change in condition.

(3) Consideration for other patients:

- (a) Every effort made to move seriously ill and dying patients to private rooms.
- (b) Do not discuss condition of patient with other patients.

2. Care following death:

a. Administrative

- (1) Patient pronounced dead by medical officer.
- (2) Registrar notified immediately.

- (a) Notifies family
- (b) Notifies Chaplain
- (c) Arranges for autopsy

- 1. Consent of next of kin preferred.
- 2. May be done on military personnel without consent if deemed necessary.

- (d) Arranges for disposition of remains.

- (3) Death Report: Signed by medical officer who pronounces patient dead.

b. Care of body

- (1) Bathed, eyes and mouth closed.
- (2) All openings properly plugged to prevent discharge.
- (3) Wrapped in clean sheet.

(4) Three (3) death tags attached to body.

- (a) Right toe
- (b) Right wrist
- (c) Outside of sheet

(5) Body transferred by litter quickly and quietly to morgue by ward attendant.

c. Care of effects

- (1) Medical officer lists all clothing and valuables on ward.
- (2) Clothing turned in at baggage room.
- (3) Valuables turned over to registrar.
- (4) Registrar charged with proper disposal of clothing, money, and valuables.

d. Care of room or patient unit

- (1) All furniture cleaned immediately.
- (2) Set up in proper order as soon as possible.

e. Relatives

- (1) If present - notified of death by medical officer.
- (2) Must see registrar before leaving hospital.

- (a) Secure clothing and valuables.
- (b) Arrange for disposal of body.

Training Notes:

1. Emphasize technician's responsibilities in caring for seriously ill patients.

2. Emphasize care of the body and personal effects following death.

Fifth Period - One Hour  
Ward Records

Place: Classroom

References: TM 8-260, Ch 2

Instructional Aids:

Personnel: One man to direct conference

Equipment: One copy each of equipment listed below.

Individual Equipment: One copy per student of:  
 Sample sheet from Day and Night Report Book  
 Sample sheet from Admission and Disposition  
 Sample Nurse's Report  
 Four copies of WD AGO 8-212 per student

6th Hour - Conference, Demonstration

Points to be Covered:

1. Importance of Ward Records:

a. Records and reports used in Army hospitals are standard and made to meet the particular need.

- (1) Forms decided by the War Department.
- (2) Used in hospitals in every theater.

b. Technicians, while they may not actually make out record or report, will be using them and need to be familiar with the form and use.

2. Types of Records:

a. Admission and Disposition Book

- (1) Kept by person admitting or discharging patient.
- (2) Includes:
  - (a) Register number, name, rank, ASN, Arm or Service, source of admission, and diagnosis of all patients admitted to ward.
  - (b) Date of discharge and disposition of all patients discharged from ward.

b. Day and Night Report Book

- (1) Report of happenings on ward over twelve hour periods:
  - (a) 0700 to 1900 - Day report
  - (b) 1900 to 0700 - Night report
- (2) Kept by nurse. In absence of nurse, kept by ward master.
- (3) Includes:
  - (a) Ward census at beginning and end of period.
  - (b) All admissions - name, rank, diagnosis, bed number, TPR, and remarks about condition.

- (c) Transfers in - same as admission plus ward from which transferred.
- (d) Discharges - name, rank, disposition.
- (e) Transferred out - name, rank, ward to which transferred.
- (f) Seriously ill - name, rank, diagnosis or operation, medications, treatments, TPR, remarks about condition.
- (g) Remarks:
  - 1. Medications: Sulfa, penicillin, streptomycin, new or state doses of medications.
  - 2. Treatments: I.V. fluids, blood or plasma transfusions, major dressings, etc.
  - 3. Any change in condition of patients.
  - 4. Any change in orders.

c. Report to Nurse's Office

- (1) Time - 5 p.m. and 5 a.m.
- (2) Made by nurse; in her absence, by wardmaster.
- (3) Includes:
  - (a) Admissions: name, rank, diagnosis, TPR, remarks about condition.
  - (b) Discharges
  - (c) Seriously ill: same as Day and Night Report.
  - (d) Remarks:
    - 1. All patients on penicillin, sulfa, and streptomycin.
    - 2. All operations, major dressings, treatments.
    - 3. Any change in patients' condition.

d. Ward Morning Report

- (1) List of every patient gained or lost by the ward during 24 hour period ending at 2400 hours.
- (2) Made out by night personnel on ward.
- (3) One copy sent nightly to office which compiles hospital A & D Sheet - usually the receiving office.

e. Narcotic Book

- (1) Record of all narcotics and alcoholics received by ward:
  - (a) Date received
  - (b) Name of drug
  - (c) Strength of drug
  - (d) Amount received
  - (e) By whom received

(2) Record of all narcotics and alcoholics given to patients or lost for any reason:

- (a) Date and time given
- (b) Full name of patient
- (c) Amount of drug used
- (d) Dose given patient
- (e) Amount of drug remaining
- (f) By whom given

(3) Record checked by:

- (a) Nurse at 0700 and 1900 daily.
- (b) Ward officer - 10th and 20th and last day of every month.
- (c) Hospital inspector - once a month.

**f. Penicillin and Streptomycin Record**

(1) Record of all penicillin and streptomycin received by ward.

- (a) Same information recorded as in narcotic book.
- (b) Strength of drug and amount received are recorded in units.

(2) Record of all penicillin and streptomycin given to patients or lost for any reason. (Same as narcotic book).

(3) Record checked. (Same as narcotic book).

**Training Notes:**

1. Use sample copies to demonstrate hypothetical cases during explanation.

2. Stress importance of neatness and accuracy when dealing with ward records.

**Sixth Period - One Hour**  
**Ward Records**

**Place:** Classroom

**References:** TM 8-260, Ch 2; TM 8-262, Ch 2

**Instructional Aids:**

**Personnel:** One man to direct conference

**Equipment:** 1 Sample Chart as listed below; 1 MD 55-A, revised

Individual Equipment: 1 Sample Chart containing the following forms per student:  
WD AGO 8-23, 8-34, 8-36, 8-37, 8-38, 8-39, 8-40,  
8-43, 8-51, 8-57, 8-62, 8-63, 8-66, 8-67, 8-69,  
8-71, 8-225, 8-226.

## 7th Hour - Conference, Demonstration

### Points to be Covered:

#### 1. Importance of Patient's Chart

a. The individual record or chart of each patient is kept on standard forms which are compiled by all the personnel caring for that patient.

- (1) These records must be accurate and are kept in a definite sequence so that information may be easily obtained from them.
- (2) Information on charts should never be given to anyone except by medical officer in charge of the case or with his permission.

#### 2. Explanation of Chart

##### a. Clinical Record Brief

- (1) Front sheet of patient's chart.
- (2) Serves as admission slip to ward.
- (3) Made out by admitting office.

b. History and Physical Examination: Responsibility of ward officer.

##### c. Nursing Notes and Treatment Record

- (1) Replaces
  - (a) Ward roster
  - (b) Doctor's order book
  - (c) Temperature, treatment, nurses notes
  - (d) Treatment sheet
- (2) Kept in brown folder at nurses desk - added to chart at time of discharge.
- (3) Fill in name, rank, ASN, ward number, etc., completely at time of admission.

## (4) Nursing Notes

- (a) Very brief.
- (b) No medications except F.R.N.
- (c) No TPR except elevations or as ordered by doctor.

## (5) Orders

- (a) Written directly on sheet by medical officer.
- (b) Column on right checked when medication is given or order carried out.
- (c) For patients receiving hourly medications or treatments, "Detailed Nursing Record" is attached to nursing notes and treatment record. When completed it is kept on ward for seven (7) days.

## (6) Use of Signals: Up to individual hospital; color signals for seriously ill, furloughs, etc.

d. Laboratory Reports: Individual reports glued to full size sheet as they are received on ward.

e. Radiologic Record: Individual X-Ray report glued to full size record as reports are received on ward.

f. Other sheets as needed: Depends upon illness and treatment of patient.

g. Abbreviated Clinical Record: Used for patients hospitalized only a short period.

Training Notes:

1. Explain with hypothetical cases and sample forms.
2. Stress fact that charts are permanent records and must be accurate.

Seventh Period - One Hour  
Care of Instruments

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, Chapter 8

Instructional Aids:

Personnel: One man to direct conference

Equipment: Blackboard

Individual Equipment: Notebook and pencil

8th Hour - Conference

Points to be Covered:

1. Source of Ward Instruments:

a. Central Service: Charged to ward as issued upon request from ward. Returned to supply when no longer needed on ward.

b. Medical Supply: Non-expendable property of ward. Ward officer accountable.

2. Importance of proper care and sterilization:

a. Prolong life of instrument.

b. Avoid spread of infection.

c. Protect ward officer from loss of property.

3. Methods of Cleaning:

a. Scrub with brush and cold water to remove blood, pus, and other organic material.

b. Scrub with brush and soap and hot water.

c. Rust and stain not removed by soap, scrub with brush and sand soap.

4. Method of Sterilization:

a. Instruments belonging to the ward:

- (1) Boil on ward in instrument sterilizer for twenty (20) minutes.
- (2) Wrap, label with ward number and send to central service to be autoclaved.
- (3) Soak in alcohol, Army sterilizing solution, or other sterilizing solution.

b. Instruments belonging to Central Service:

- (1) If to be reused immediately, sterilize as for instruments which are ward property.

(2) If not to be used again, clean and return to Central Service with wrapper for wrapping and sterilization.

5. Instruments to be Stored:

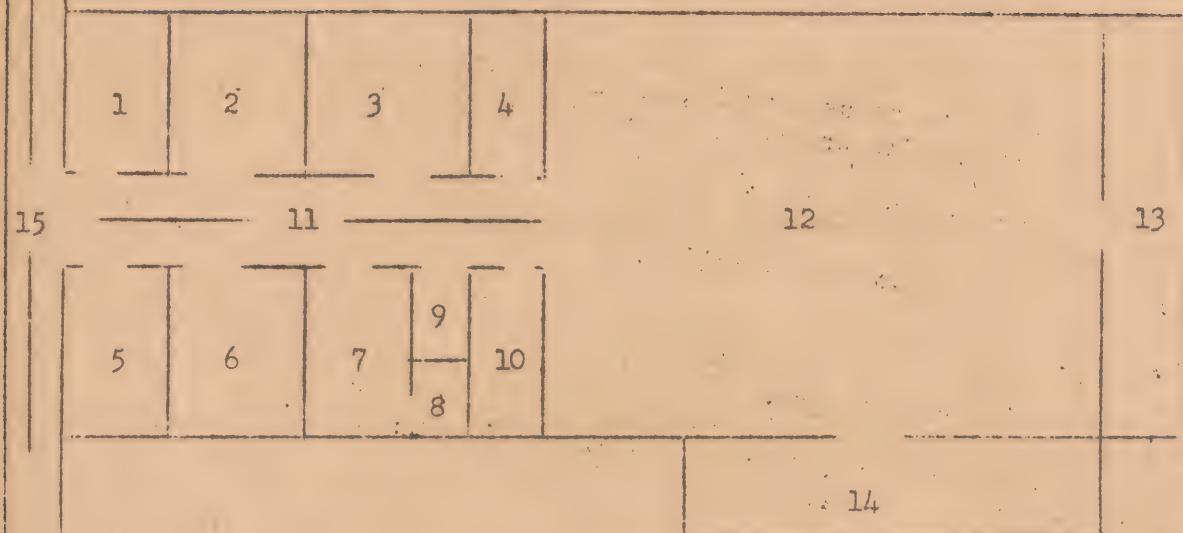
- a. Clean thoroughly and sterilize.
- b. Dry.
- c. Store in dry cupboard.

6. Repair of instruments, sharpening scissors, etc.: Repaired or exchanged by medical supply.

Training Notes:

1. Emphasize that ward officer is accountable for ward instruments.
2. Stress that in cleaning instruments pay particular attention to joints.
3. Emphasize returning instruments to Central Service when not in use on the ward.

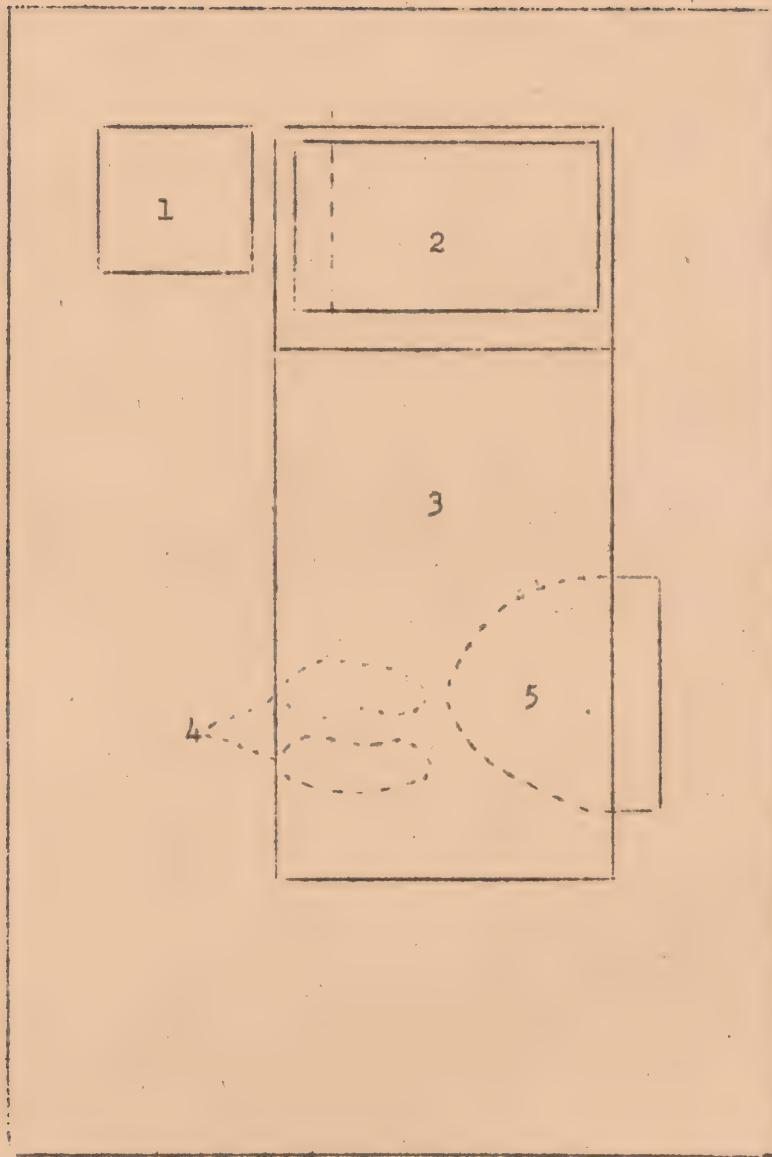
STANDARD WARD - ARMY HOSPITAL



USUAL EQUIPMENT

1. Nurses' Office	5. Doctor's Office	11. Hallway of ward
a. Desk	a. Desk	a. Fire extinguisher
b. Telephone	b. Telephone	b. Fire alarm
c. Ward Roster	c. Chairs	c. Hand litters
d. Chart racks	d. Doctor's equipment depending on type of ward	(d on racks on wall)
2. Clothing Room	7. Linen Room	12. Ward
a. Cubicles or hangars for individual patient's clothing and equipment	a. Shelves with clean linen, blankets, etc	a. 30-50 patient units
3. Ward Kitchen	b. Shelves with supplies	13. Enclosed Porch
a. Stove	8. Nurses' Latrine	a. Wheel chair
b. Refrigerator	a. Latrine	b. Table
c. Cupboard with dishes, etc.	b. Wash basin	c. Chairs or sofas
d. Sink	9. Soiled linen cupboard	d. Bookcase with books, magazines, games, etc.
e. Table	a. Hamper for soiled linen	14. Open Porch
f. Trays	10. Utility Room	a. Table
4. Patients' Latrine	a. Hopper	b. Chairs
a. Latrines	b. Sink	15. Corridor to other wards
b. Wash basins	c. Rack with bedpans & urinals	
c. Showers	d. Shelves with emesis basins and other enamelwear	
5. Treatment Room	e. Utensil sterilizer	
a. Medicine Closet		
b. Dressing cart		
c. Examining Table		
d. Chairs		
e. Closet for supplies		

NOTE: This may vary to comply with different physical set-up in different type wards in different hospitals.



1. Bedside Table
2. Pillow
3. Bed
4. Patient's shoes
5. Chair



PERIOD	HOURS	WEEK	SUBJECT
1	1	1	Introduction
2	1	1	Care of the Ambulatory Patient
3	2	1	Care of Linens and Supplies
4	2	1	The Unoccupied Bed
5	2	1	Admission, Discharge, and Transfer of Patient
6	2	2	The Occupied Bed
7	2	2	Care and Comfort of the Patient
8	2	2	Blood Pressure
9	1	3	External Applications
10	3	3	Temperature, Pulse, and Respiration
11	3	3	Diets and Trays
12	3	3	Baths and Bathing
13	2	3	Oxygen Therapy
14	1	3	Use and Care of Rubber Goods
15	2	4	Enemata
16	2	4	Catheterization
17	1	4	Gastric Lavage and Gavage
18	1	4	Aspiration of Body Cavities
19	2	4	Postoperative Bed
20	2	4	Care and Comfort of the Patient
21	2	4	Fracture Bed and Other Orthopedic Appliances
22	3	5	Hypodermics

PERIOD	HOURS	WEEK	SUBJECT
23	2	5	Isolation Technique
24	1	5	Prevention of the Transmission of Communicable Diseases in the Hospital
25	2	5	Nursing Care of Communicable Diseases
26	1	5	Nursing Care of Tropical Fevers
27	2	6	Preoperative and Postoperative Care
28	1	6	Nursing Care of Burns
29	2	6	Nursing Care of Mental Patients
30	1	6	Medical Technician and the Nervous Patient
31	2	7	Care of the Ward
32	1	8	Elimination of Body Wastes
33	1	8	Medications; General Rules in Giving Medications
34	2	8	Bed Making Review
34	60		TOTAL

1. Purpose and Scope: The purpose of this course is to teach students nursing procedures which they may be required to perform as technicians when caring for patients. Emphasis will be placed on correct performance of procedures which technicians are most likely to be called upon to do. This course should include classes in:

Care of the Ambulatory Patient  
 Care of Linens and Supplies  
 Making Different Types of Hospital Beds  
 Admission, Transfer, and Discharge of Patients  
 Care and Comfort of Patients  
 Blood Pressure, Temperature, Pulse, and Respiration  
 Diets and Trays  
 Baths and Bathing  
 Oxygen Therapy  
 Enemata and Catheterization  
 Gastric Lavage and Gavage

Aspiration of Body Cavities  
Fracture Bed and Other Orthopedic Appliances  
Hypodermic Medication  
Isolation Technique and Nursing Care of Communicable Diseases  
Preoperative and Postoperative Care  
Nursing Care of Burns  
Nursing Care of Mental Patients  
Care of the Ward  
Elimination of Body Wastes  
General Rules in Giving Medications

2. Standard of Proficiency: At the completion of the course each student should:

a. Be able to perform procedures taught with supervision.

b. Have a basic knowledge of the general nursing care of medical and surgical patients.

c. Be aware of the responsibilities for the welfare of patients on the part of persons caring for them while hospitalized.

3. Basic References: TM 8-220; TM 8-260; "Principles and Practice of Nursing," Harmer and Henderson; "Essentials of Nursing," Young; "Orthopedic Nursing," Funstein and Caldewood.

First Period - One Hour  
Introduction

Place: Classroom

References: None

Instructional Aids:

Personnel: One officer to act as lecturer

Equipment: None

Individual Equipment: Notebook and pencil

1st Hour - Lecture

Points to be Covered:

1. Purpose of the course - To teach technicians the principles of nursing care and the correct application of those principles.
2. Relationship of technicians to ward personnel.

a. Technicians and Ward Officer: Has little direct contact with ward officer except on ward rounds and special treatments. Desires of the ward officer usually reach the technician through the nurse or the wardmaster or both.

b. Technicians and Nurses: All nursing procedures are done under the supervision of nurses. Housekeeping duties may be directed by the nurse through the wardmaster.

c. Relation of technicians to each other:

- (1) The wardmaster directs the work of all other technicians on the ward.
- (2) Technicians working together must act as a team and must share housekeeping as well as technical duties.

### 3. Responsibilities of the technician.

a. To the patient: To provide care which will comfort and benefit the patient and hasten his recovery.

b. To the ward: To put forth effort to assume his share of responsibility in making the ward a smooth running and efficient unit.

4. Military courtesy must be observed at all times in the Army and will not be relaxed in the hospital ward. Such courtesy applies to patients, other ward personnel both military and civilian, visiting and inspecting officers, and visitors.

#### Training Notes:

1. Stress relationship between the role of the technician and the efficiency of the ward as a whole.

2. Emphasize the fact that procedures taught in the course will be performed on the wards under a nurses and wardmasters supervision.

#### Second Period - One Hour Care of the Ambulatory Patient

Place: Classroom

References: TM 3-260, Ch 2 & 4; "Principles and Practice of Nursing," Harmer and Henderson, Ch XXI

#### Instructional Aids:

Personnel: One officer to act as lecturer

Equipment: Blackboard

Individual Equipment: Notebook and pencil

2d Hour - Lecture

Points to be Covered:

1. Introduction

- a. The ambulatory patient: Able to be up, not confined to bed.
- b. Reasons for large percent of ambulatory patients in Army hospitals:
  - (1) Convalescent patient must remain in hospital until able to return to full duty.
  - (2) Patients not sick enough for hospital care, but too sick to remain in barracks.
  - (3) Administrative admissions:
    - (a) Patients for C.D.D.
    - (b) Patients for retirement.
    - (c) Patients for reclassification of physical status.

2. Explanation

a. Professional problems:

- (1) Patient present for doctor's rounds.
- (2) Patient present for medicines, dressings, and treatments.
- (3) Patients present for special diets.
- (4) Patients follow diet and medication orders if away from the hospital.

b. Administrative problems:

- (1) Patients abide by rules and regulations of the ward including getting up in morning and putting out lights at night.
- (2) Keep own unit clean and neat.
- (3) Patient to assume responsibility for treatment and medication as directed.
- (4) Patient in walls on ward as ordered by ward officer.
- (5) Present for work at correct hours.
- (6) In proper uniform at all times.
  - (a) Uniform:
    - 1. New, clean suit - matching and buttoned.
    - 2. Bath robe - belted.

(b) Officer - must be in correct complete uniform.

c. Rehabilitation and education facilities:

(1) Reconditioning

(a) Four classes according to patient's physical condition.

1. Simple exercises for bed patients.
2. Movies and lectures.
3. Light activity - hikes, etc.
4. Full activity.

(b) Compulsory - ordered by ward officer.

(2) I & E - information available from I & E officer.

(3) Library - reading room and lending library.

(4) Occupational therapy - work shops for leather work, metal work, etc.

d. Recreation

(1) Movies and USO shows on post.

(2) Special parties and entertainment planned by ARC.

(3) Passes to shows and entertainment - obtained through special service.

e. Leaves, passes, and furloughs:

(1) Passes granted according to ward rules.

(2) Sick leave or furlough - granted while waiting for records or convalescing from illness.

(a) Not over 30 days (usually).

(b) Must not interfere with treatment.

(c) Does not count against annual leave.

Training Notes:

1. Stress that ambulatory patients must abide by ward rules and regulations.

2. Emphasize facilities available to occupy their time.

3. Emphasize importance of occupational and diversional therapy.

Third Period - Two Hours  
Care of Linens and Supplies

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson,  
Appendix I

Instructional Aids:

Personnel: One man as demonstrator; one man per eight (8) students  
to supervise applicatory work

Equipment: Clean linen as available (minimum)

50 sheets	20 bath towels
20 wash cloths	20 pajama tops
20 hand towels	20 pajama bottoms
20 blankets	Enamel basin
Soiled linen hamper	Cleaning rags
Soiled linen as available	GI soap

Stock expendable ward supplies as available

Individual Equipment: One set of equipment as used for demonstration  
for each student

3d & 4th Hours - Conference, Demonstration, Application

Points to be Covered:

1. Introduction

a. Linen property of ward

- (1) Ward officer accountable for all linen
- (2) Wardmaster and all ward personnel responsible to ward officer for proper care.

b. Expendable supplies of ward ordered weekly (or bi-weekly)  
by nurse and wardmaster.

c. Need for proper care:

- (1) Prolong life of linen.
- (2) Better utilization of supplies.

2. Explanation and Demonstration

a. Care of clean linen

(1) Linen room (demonstrate)

- (a) Lined with shelves.
- (b) Linen uniformly arranged.

1. Better utilization of supplies.
2. Neater appearance.
3. Easier to count,

- (c) Cleaning: Wash shelves at least once per week; dust daily with damp cloth before stacking clean linen.
- (d) Door must be kept locked at all times.

(2) Folding linen: Demonstrate according to procedures on attached sheet.

(3) Stacking on shelves - demonstrate

- (a) Stack with folded side of linen even with shelf, or as directed.
- (b) Stack with left corner square.

b. Care of soiled linen

- (1) Placed in soiled linen hamper
  - (a) Wet linen: Dry before placing in hamper.
  - (b) Stained linen: Remove stain if possible before placing in hamper.
- (2) Door to soiled linen room must be kept locked

c. Torn linen

- (1) Mend: Send to sewing room before using for patient.
- (2) Unable to mend: Turn in for salvage.

d. Linen exchange

- (1) Time: Daily, three (3) times weekly, etc., depending on laundry facilities.
- (2) Preparation:
  - (a) Count on ward.
  - (b) Like pieces put in bundles of definite number.
  - (c) Laundry list: Prepared by ward personnel; list number of each type of linen for exchange.

(3) Central linen room:

- (a) Soiled linen taken to central linen room and exchanged for same number of pieces of clean linen.
- (b) Linen must be exchanged by ward personnel, never by patient.
- (c) Clean linen counted as received: Ward personnel must count linen; if short, get I.O.U. slip.

e. Borrowing linen: Never lend or let linen leave ward without replacement or I.O.U. slip.

f. Expendable supplies:

- (1) Order only what is needed for one week.
- (2) Stack neatly on shelf in linen room or cleaning closet, like articles together.
- (3) Keep locked.

3. Procedures

a. Bath towels

- (1) Fold end to end
- (2) Repeat fold
- (3) Fold side to side with ends of towels inside

b. Face towels

- (1) Same as above

c. Pillow cases

- (1) Same as above

d. Sheets

- (1) Fold lengthwise
- (2) Fold end to end with edges of sheet on inside
- (3) Repeat above fold twice more
- (4) Fold in half

e. Blankets

- (1) Fold lengthwise twice
- (2) Fold end to end with edges of blanket on inside
- (3) Repeat above fold once

f. Wash clothes

- (1) Fold in quarters

g. Bath Robes

- (1) Fold shoulder to shoulder with front of robe on inside
- (2) Tuck ends of belt on inside of fold
- (3) Fold both arms on one side
- (4) Fold in half, top to bottom, with arms on inside
- (5) Repeat fold

h. Pajama and Convalescent Pants

- (1) Fold lengthwise matching legs
- (2) Fold seat in to width of legs
- (3) Fold in half, bottom to top, with seat on inside
- (4) Repeat fold

i. Pajama or Convalescent Tops

- (1) Fold shoulder to shoulder with buttons on inside
- (2) Fold both arms on one side
- (3) Fold in half once, top to bottom, with arms on inside

4. Applicatory

- a. Students fold each type of linen as demonstrated.
- b. Students stack linen as demonstrated.
- c. Students stack expendable ward supplies on shelves.

Training Notes:

1. Stress folding edges of linen on inside.
2. Stress cleaning shelves before stacking.
3. Stress placing like articles together in both linen and supplies.
4. Stress stacking linen evenly and uniformly.
5. Stress keeping linen and supplies locked.

Fourth Period - Two Hours  
The Unoccupied Bed

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson,  
Ch 5

Instructional Aids:

Personnel: One man to direct conference and demonstration;  
one man per six (6) students to supervise applicatory work

Equipment: 1 patient unit: Bed with mattress, mattress cover and pillow, bedside table, chair, 3 sheets, 1 pillow case, 1 rubber draw sheet

Individual Equipment: 1 set per student; 1 patient unit, 3 sheets, 1 rubber draw sheet, 1 pillow case

5th & 6th Hours - Conference, Demonstration, Application

Points to be Covered:

1. Introduction and Explanation

a. Objectives of bedmaking

- (1) Comfort of the patient: Sheet tight, smooth, and free from wrinkles to prevent pressure sores.
- (2) Economy of materials, time, and energy.
  - (a) Assemble equipment before starting.
  - (b) Avoid unnecessary steps - moving from side to side of bed.

b. Care of equipment

- (1) Do not place clean or soiled linen on floor or on the furniture in another patient's unit.
- (2) Do not sit on bed or bedside table.

2. Demonstration

a. Demonstrate patient's unit according to diagram.

b. Demonstrate the making of the bed according to the following procedure.

3. Procedure

a. Preparation

- (1) Assemble the equipment: 3 sheets, 1 pillow case, 1 rubber draw sheet.
- (2) Place the linen on the chair at the foot of the bed.
- (3) Turn the mattress, straighten mattress cover removing all wrinkles.

b. Steps

- (1) Place the sheet on the bed, even with mattress at foot, center fold in center of bed. Tuck sheet under at top of mattress. (Work from side of bed, never from head or foot.)
- (2) Miter top corner of sheet carefully on one side.
- (3) Go to lower corner of bed on same side and pull sheet tight.

- (4) Tuck in sheet along same side of mattress.
- (5) Place the rubber draw sheet in the middle of the bed. Tuck under mattress at side of bed.
- (6) Cover rubber draw sheet with linen draw sheet (large sheet folded end to end), placing the folded edge at the top, and one inch above rubber draw sheet.
- (7) Go to opposite side of the bed and pull bottom sheet tight across top and miter corner carefully.
- (8) Tighten the sheet across the middle and tuck it under the mattress along the side.
- (9) Tuck the rubber draw sheet under the mattress.
- (10) Tuck the linen draw sheet under the mattress.
- (11) Place the top sheet on the bed even with the mattress at top.
- (12) Tuck in sheet at bottom, miter corner.
- (13) Fold top sheet down eight (8) inches from the top forming a cuff.
- (14) Go to the opposite side of the bed. Tuck in top sheet carefully at bottom and miter corner. Complete fold at top.
- (15) Put the pillow case on the pillow. If the case is larger than the pillow, make it fit by placing a pleat in the case on the seamed side. Always place the closed end of the pillow case toward the door on the right side of the ward and away from the door on the left side of the ward. Pleat on pillow case should be on bottom of pillow toward top of bed.

c. Follow up

- (1) Place bedside table at head of bed on patient's right.
- (2) Place chair at foot of bed on patient's left.

4. Application

- a. Students set up patient units and make beds as demonstrated. (Twice if time permits)
- b. Care of equipment
  - (1) Students fold and turn in linen.
  - (2) Stack and count linen before class is dismissed. Arrange as in linen cupboard.

Training Notes:

1. Stress care of equipment:

- a. Never place soiled linen on floor.
- b. Never sit on bed or bedside table.

2. Assign only one student to a bed.
3. Supervise closely, correct mistakes as they are made.
4. Emphasize pulling bottom covers tight.
5. Stress neatness and uniformity in bedmaking.

Fifth Period - Two Hours  
Admission, Discharge, and Transfer of Patient

Place: Classroom

References: TM 8-220, Ch 6; TM 8-260, Ch 2; TM 8-262, Ch 2;  
 "Principles and Practice of Nursing," Harmer and Henderson, Ch 6

Instructional Aids:

Personnel: One man to direct conference and demonstration

Equipment: 1 patient unit: 3 sheets, 1 rubber draw sheet,  
 1 pillow case, 1 MD 55A - revised, 1 bed card,  
 1 clothing slip

Individual Equipment: Notebook and pencil

7th & 8th Hours - Conference, Demonstration

Points to be Covered:

1. Types of patients admitted to Army hospitals:
  - a. Military personnel on active duty
  - b. Retired military personnel
  - c. Veterans
  - d. Civilian dependents of military personnel
  - e. U.S. Public Health employees
  - f. Emergencies
2. Admission of Patients
  - a. Sources of admission
    - (1) Direct, informal, by command - first hospital to which admitted.
    - (2) Indirect, formal - transferred from another hospital.
  - b. Types of admission

(1) Emergency: Requires immediate care or treatment.

- (a) Seen by admitted officer
- (b) Sent directly to ward
- (c) Necessary admission data later

(2) Routine: Other than emergency.

- (a) Examined by medical officer
- (b) Admission slip - clinical record brief made out
- (c) Valuables and clothing disposed of
- (d) Sent to proper ward

c. Steps in admitting a patient on ward

(1) Ambulatory patient

- (a) Greet patient on arrival to ward and take his clinical record brief.
- (b) Check clinical record brief to be sure patient is on proper ward.
- (c) Assign patient to bed.
- (d) Give patient bathrobe, pajamas, bath towel, hand towel, and wash cloth.
- (e) Take patient's TPR.
- (f) Have patient bathe, put on pajamas and robe, or convalescent suit.
- (g) Explain ward rules and regulations to patient.
- (h) Check clothing and take to patients' clothing room.
- (i) Notify ward officer of admission.
- (j) Make out records:

1. Admission and disposition book
2. Nurses' day and night report book
3. Ward roster
4. Enter name on ward morning report
5. Make chart - fill in lab slips (varies with ward and service)
6. Record TPR and admission notes on nurses notes.
7. Make out bed card and place on bed as directed on ward.

(2) Emergency patient (ward should be notified in advance)

- (a) Nurse and ward officer notified immediately.
- (b) Put patient to bed.

1. Help as needed in undressing of patient.
2. Put pajamas on patient.

- (c) Take TPR
- (d) Carry out doctor's orders
- (e) After patient is cared for complete records as for ambulatory patient.

### 3. Discharge of patients

#### a. Disposition of patients

- (1) Duty
- (2) Transfer to another hospital
- (3) C.D.D. - physical discharge for enlisted personnel on reserve status
- (4) Retired
- (5) A.W.O.L.
- (6) Death
- (7) Home - civilians, veterans, retired personnel only
- (8) Sick leave or furlough - temporary discharge

#### b. Steps in discharging a patient from ward:

- (1) Completed chart sent to chief of service.
- (2) Receiving office notifies ward when patient may leave.
- (3) Instruct patient in clearing the post. (Officers and retired personnel pay \$1.00 per day)
- (4) When clearance is completed give patient his clothing.
- (5) Clean patient's unit and remake bed.
- (6) Records:
  - (a) Note discharge in nurses' Day and Night Report Book.
  - (b) Note discharge in Admission and Discharge Book.
  - (c) Remove patient's name from ward roster.
  - (d) Enter name on Ward Morning Report, indicating type of discharge.

### 4. Inter-ward transfer

#### a. Steps in transferring a patient to another ward:

- (1) Doctor leaves order for transfer of the patient.
- (2) New ward contacted by telephone to make certain bed is available.
- (3) Transfer slip made out (1 copy) and signed by ward officer.
- (4) Transfer noted on nurses' notes.
- (5) Patient, his personal belongings, and his chart with transfer slip taken to new ward. (Patient must be accompanied)
- (6) Patient received on new ward. Person accompanying patient receives exchange for pajamas, bathrobe, and other ward linen.

- (7) Remake patient's unit
- (8) Records:

- (a) Note transfer in A & D Book.
- (b) Note transfer in nurses' Day and Night Report Book.
- (c) Remove name from ward roster.
- (d) Enter name on ward morning report.

b. Steps in receiving a patient transferred from another ward:

- (1) Assign patient to bed. Assist in putting him to bed if necessary.
- (2) Give ward personnel accompanying patient exchange for pajamas, bathrobe, and other linen.
- (3) Notify ward officer of transfer.
- (4) Records:

- (a) Sign transfer slip (ward officer) and send to information office.
- (b) Admission and Disposition Book.
- (c) Enter name on ward morning report.
- (d) Nurses' Day and Night Report Book.
- (e) Patient's name on ward roster.
- (f) Note transfer on nurses' notes.

4. Demonstration

a. Demonstrate each step in admitting an ambulatory patient to the ward.

b. Demonstrate each step in discharging a patient from a ward.

c. Demonstrate the steps in transferring a patient from one ward to another.

Training Notes:

- 1. Stress importance of greeting patient cheerfully on admission.
- 2. Emphasize need for immediate care of emergency patients.
- 3. Stress the process of "clearing the post."
- 4. Stress importance of all property, charts, etc., accompanying patient when transferred from one ward to another.

Sixth Period - Two Hours  
The Occupied Bed

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, Ch 12

Instructional Aids:

Personnel: One officer; one enlisted man per eight (8) students to supervise applicatory work

Equipment: 1 patient unit, 5 sheets, 2 pillow cases, 1 pair pajamas, 1 rubber draw sheet

Individual Equipment: 1 set for every 2 students: 1 patient unit, 5 sheets, 1 rubber draw sheet, 2 pillow cases, 1 pair of pajamas per student

9th & 10th Hours - Conference, Demonstration, Application

Points to be Covered:

1. Objectives of bedmaking

a. Comfort of patient

- (1) Bottom sheet - draw sheet tight and free from wrinkles.
- (2) Pillow smooth, free from lumps.
- (3) Avoid unnecessary turning and jostling of patient.

b. Neat uniform appearance

- (1) All beds made in same manner.
- (2) Top covers centered on bed.

2. Demonstrate changing the bed linen and remaking the bed according to the following procedure:

a. Stress assisting patient in turning and in lifting head.

b. Stress pulling bottom covers tight and mitering corners.

- (1) Comfort of patient
- (2) Bed looks better, stays made longer

c. Stress ample room for feet and toes.

3. Procedure

a. Preparation

- (1) Assemble equipment: 2 sheets, 1 pillow case.
- (2) Place clean linen on chair at foot of bed.

b. Steps

- (1) Loosen all top covers. Remove all except top sheet and place on chair, never on floor.
- (2) Remove pillow and change pillow case.
- (3) Place the clean top sheet over the patient.
- (4) Remove the soiled sheet that covers the patient.
- (5) Fold this sheet in half, end to end, and use as draw sheet.
- (6) Change the bottom sheet and draw sheet:
  - (a) Turn patient on side.
  - (b) Loosen the draw sheet and roll it tightly to the middle of the bed.
  - (c) Loosen rubber draw sheet and roll it to the middle of the bed.
  - (d) Straighten the mattress cover.
  - (e) Place the clean bottom sheet on the bed. Tuck under mattress at top and miter corner. Tuck in along side of mattress. Fold other side of sheet to middle of bed.
  - (f) Bring the rubber draw sheet into place. Pull tight and tuck under mattress.
  - (g) Place the draw sheet (see 5 above) on the bed. Tuck under mattress. Fold other end to middle of bed.
  - (h) Turn patient facing you and go to opposite side of bed.
  - (i) Loosen linen draw sheet and remove.
  - (j) Pull clean draw sheet through and turn across patient's hips.
  - (k) Loosen rubber draw sheet and turn across patient's hips.
  - (l) Remove the soiled bottom sheet. Straighten mattress cover.
  - (m) Pull the clean bottom sheet through. Tuck under mattress at top, miter corner. Tuck under side of mattress, pulling sheet tight.
  - (n) Bring rubber draw sheet into place, pull tight, and tuck under mattress.
  - (o) Bring linen draw sheet into place, pull tight, and tuck under mattress.
- (7) Turn patient on back. Place the pillow under his head.
- (8) Proceed with top covers as for unoccupied bed.

c. Follow up

- (1) Leave the bed, bedside table, and chair neat and in proper order.
- (2) Take out soiled linen.

4. Applicatory - assign 50% of students as technicians, 50% as patients.

a. Preparation

- (1) Patients dress in pajamas.
- (2) Technicians set up patient units and make beds.

b. Student changes bed linen on bed occupied by a student acting as patient.

c. Repeat steps "a" and "b" - patient acts as technician; technician as patient.

Training Notes:

1. Patient units should be set up; unoccupied bed prepared for demonstration in advance.
2. Use student dressed in pajamas for patient during demonstration.
3. During applicatory exercises supervise closely; correct mistakes and breaks in procedure as they are made.
4. Stress care of equipment as taught in class on the unoccupied bed.

Seventh Period - Two Hours  
Care and Comfort of the Patient

Place: Classroom

References: "Essentials of Nursing," Young, Part I; "Principles and Practice of Nursing," Harmer and Henderson, Ch XV.

Instructional Aids:

Personnel: One man to direct conference and demonstration

Equipment: 1 patient unit, 7 sheets, 1 blanket, 1 pillow case, 1 wheel litter with pad, 1 pair pajamas, 1 rubber draw sheet

Individual Equipment: 1 set for every two students: 1 patient unit, 3 sheets, 1 pillow case, 1 rubber draw sheet, 1 pair of pajamas per student

11th & 12th Hours - Conference, Demonstration, Application

Points to be Covered:

1. Care of skin - Pressure Sores

a. Definition: Sores caused by pressure which interferes with circulation of part. Usually due to poor nursing care and in most instances can be prevented.

b. Causes of pressure:

- (1) Weight of body on the bed - infrequent turning.
- (2) Crumbs and wrinkles in the sheets.
- (3) Bandages, casts, and splints.

c. Factors which lead to development of pressure sores:

- (1) Drainage from wounds.
- (2) Incontinence as to urine or feces.
- (3) Dry, tender skin.
- (4) Paralysis.
- (5) Diabetes mellitus.
- (6) Prolonged illness.

d. Parts most affected - bony prominences:

- (1) End of spine
- (2) Elbows
- (3) Shoulders
- (4) Hips
- (5) Heels

e. Preventive measures - prevention not always easy, but easier than the cure:

- (1) Keep patient clean.
- (2) Bed clean, dry, and free from wrinkles.
- (3) Stimulate circulation by rubbing part with alcohol frequently and massage of part only as directed by nurse.
- (4) Protect skin from drainage.
- (5) Change patient's position.

f. Treatment - as ordered by doctor. Notify nurse at first sign of development of pressure sores.

2. Preparation of patient for night.

a. Special care needed by all bed patients.

b. Purpose:

- (1) To make patient rest more comfortably.
- (2) To prevent bed sores.

c. Steps:

- (1) Brush patient's teeth.
- (2) Rub patient's back with alcohol.
- (3) Straighten linen, change as needed.
- (4) Rearrange pillows.
- (5) Give patient fresh drinking water.

### 3. Demonstration

a. Demonstrate turning a patient in bed according to the following procedure.

b. Demonstrate lifting a patient in bed according to the following procedure.

c. Demonstrate preparing the litter and moving the patient to and from bed to litter according to the following procedure.

### 4. Procedure

a. Turning patient in bed (position of patient to start - lying on back).

- (1) Stand on side of bed.
- (2) Bend patient's knees, and turn head if patient is unconscious.
- (3) Place one hand on patient's opposite hip and the other on patient's opposite shoulder.
- (4) Turn patient toward you.
- (5) Support as needed - pillows to back, between knees, etc

b. Lifting patient to bed:

- (1) Patient able to assist
  - (a) Have patient hold head of bed with both hands and bend knees.
  - (b) Place one hand under patient's shoulders and one under his hips.
  - (c) Tell patient to pull with his hands and push with his heels as you lift him.
- (2) Patient unable to assist (two technicians will be needed)
  - (a) Stand on opposite sides of the bed.
  - (b) Technicians each place one hand under the patient's shoulders and one hand under the patient's hips. (If patient is very weak, one technician supports the head instead of the shoulders with one hand.)
  - (c) Lifting together, raise the patient to the desired position in bed.

c. Litter

(1) Preparation

- (a) Assemble equipment: 1 wheel litter with mattress, 4 sheets, 1 blanket
- (b) Cover mattress with sheet, tuck in at ends and sides.
- (c) Drape in order on litter, with center fbd in center of litter: 1 sheet, blanket, 1 sheet,
- (d) Place fourth sheet folded at head of litter. (This will be used to cover patient.)
- (e) Fold all covers even with mattress on right side and fold ends in at center of litter.
- (f) Repeat for the left side.
- (g) Tuck covers under mattress at each end.

(2) Steps

(a) To lift patient to litter (three persons)

1. Cover patient with extra sheet from litter and fold bed covers to foot of bed.
2. Loosen draw sheet under patient to use for lifting.
3. Bring litter to bedside. Place it close to bed and parallel to it.
4. One person stands at head of litter to lift head and shoulders of the patient.
5. One person stands beside bed opposite litter and grasps draw sheet with both hands. Stand against bed to prevent bed from moving.
6. One person stands beside litter and grasps draw sheet with one hand, placing other hand under patient's feet. Stand against litter to prevent litter from moving.
7. All lifting together, patient is moved to litter.
8. Fold litter covers from sides over patient, folding top corners back away from face, and tucking in at bottom.
9. Remake bed and arrange unit.

(b) To move patient from litter to bed (three persons)

1. Fold bed covers to foot or side of bed.
2. Bring litter with patient to bedside. Place close to bed and parallel to it.
3. Loosen covers at foot of litter and drop at sides leaving patient covered only with sheet.

4. One person stands at head of litter to support patient's head.
5. One person stands against side of bed opposite litter and places one hand under patient's shoulders.
6. One person stands against side of litter placing one hand under patient's hips, the other under patient's feet.
7. All lifting together move patient to bed.
8. Cover patient with bed covers and remove cover sheet.
9. Move litter from bedside.
10. Make patient comfortable and remake bed.

(3) Follow up

- (a) Remake litter with clean linen.
- (b) Put litter away.

5. Application

a. Students turn, lift, and move patients as demonstrated (use student as patient).

b. Repeat step "a" (student acting as patient becomes technician; student acting as technician, patient).

Training Notes:

1. Stress that bed sores are usually due to poor nursing care.
2. Stress leaving patient comfortable and unit straight after any procedure.
3. Supervise applicatory exercise closely - correct mistakes as they are made.
4. Leave beds well made at end of class.

Eighth Period - Two Hours  
Blood Pressure

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, Ch 10

Instructional Aids:

Personnel: One man to act as demonstrator; one man per eight (8) students for application

Equipment: 1 sphygmomanometer, box, mercurial; 1 sphygmomanometer, dial, aneroid; 1 stethoscope, complete; non-standard charts

Individual Equipment: Notebook and pencil; 1 sphygmomanometer per 2 students; 1 stethoscope, complete, per 2 students

13th & 14th Hours - Conference, Demonstration, Application

Points to be Covered:

1. Introduction and Explanation

a. Definition: Pressure exerted by the blood on the wall of the blood vessels. Usually refers to the pressure in the brachial artery of the arms. Measured in millimeters of mercury.

b. Arterial Pressure: The degree of pressure depends on the force of the heart beat and the condition of the walls of the arteries. Pressure is higher in the arteries than in the veins because the arteries get the force of the heart beat and arteries are less numerous thus confining the blood to a smaller area. Two readings are recorded in taking arterial blood pressure:

(1) Systolic: The highest pressure in the arteries which immediately follows contraction of the ventricles of the heart. Normal range 100-140.

(2) Diastolic: The lower pressure level which follows relaxation of the ventricles of the heart; normal range 60-100 mm.

c. Pulse Pressure: The difference between systolic and diastolic blood pressure. Example: Systolic pressure - 120; Diastolic pressure - 80; Pulse pressure is 40.

d. Venous Pressure: Low and constant because of large number of vessels for blood to circulate through and because the force and impulses of the heart beat are not felt. Venous pressure is used only in helping to diagnose. It shows the efficiency of the heart muscles.

e. Variations in blood pressure:

(1) Normal variations:

- (a) Exercise - increases blood pressure
- (b) Emotional Excitement - increases blood pressure
- (c) Age - usually blood pressure is higher in advancing age due to decreased elasticity of the walls of the vessels.

## (2) Abnormal variations:

## (a) Hypertension or high blood pressure seen in:

1. Arteriosclerosis or hardening of the blood vessels.
2. In some poisoning by certain drugs, bacterial toxins, or poisons produced by kidney disease. Such poisoning causes constriction of blood vessels.
3. In increased intracranial pressure because of pressure on the vasomotor center in the brain. Hence the need for constant checking of blood pressure following brain operations or head injuries.

## (b) Hypotension or low blood pressure seen in:

1. Diseases which weaken heart action or decrease tone of blood vessels.
2. Shock and hemorrhage.
3. Certain drugs cause lowering of blood pressure.

## 2. Demonstration

- a. Demonstrate types and operation of sphygmomanometer.
- b. Demonstrate use of stethoscope.

## 3. Procedure

- a. Explain the procedure to the patient.
- b. Have patient lie in bed or sit quietly in chair with arm to be used supported.
- c. Roll sleeve above elbow or slip it off.
- d. Apply cuff of sphygmomanometer well above elbow smoothly and not too tightly.
- e. Place sphygmomanometer on bedside table or bed in a position that makes the scale easily readable.
- f. Locate brachial artery at inner aspect of the elbow. Hold stethoscope at this point.
- g. Adjust air valve with free hand, pump bulb and inflate cuff until artery is occluded. (Mercury column should reach 200 mm. mark.)

- h. Open valve slowly, releasing air from the cuff. (The mercury column should not fall faster than 5 mm. per second.)
- i. Note exact height of mercury column at the first sound, a sharp snapping or thumping, is heard and this is the systolic pressure.
- j. Let cuff deflate until sounds heard change to a soft swishing sound and then to a loud thumping sound. Note height of mercury column at point the loud thumping sound ceases and record as the diastolic pressure.
- k. Release pressure entirely and repeat procedure to check readings. (The two readings should check within 5 mm. of mercury.)
- l. Record blood pressure as a fraction with systolic reading above and diastolic reading below, thus: Systolic - 120  
Diastolic - 80

- 4. Application: Have students practice taking blood pressure on each other.

#### Training Notes:

- 1. Emphasize importance of position of patient in taking blood pressure.
- 2. Emphasize need for accuracy. If unsure of reading have someone check.

#### Ninth Period - One Hour External Applications

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson,  
Ch 23

#### Instructional Aids:

Personnel: One man to act as demonstrator

Equipment: 1 electric hot plate; 1 enamel basin; 3 Dakins tubes;  
6 ABD pads; 1 bottle sterile normal saline; 4 doz 4 x 4's;  
2 rolls 2" gauze bandage; 2 hand towels; 1 asepto syringe;  
1 triangular bandage; 1 rubber square, ice

Individual Equipment: Notebook and pencil

15th Hour - Conference, Demonstration

Points to be Covered:

## 1. Actions of heat and cold:

## a. Upon superficial blood vessels:

- (1) Heat - dilates
- (2) Cold - contracts

## b. Upon nerves:

- (1) Heat - no effect
- (2) Cold - soothes nerve endings

## c. Upon muscles:

- (1) Heat - relaxes cramped muscles
- (2) Cold - tendency to contract muscles

## 2. Purposes of hot and cold applications:

## a. To relieve pain:

- (1) Heat - by relaxing muscles, tendons, and ligaments
- (2) Cold - by soothing nerve endings

## b. Infection:

- (1) Heat - localize infection and promote drainage
- (2) Cold - check inflammation and prevent drainage

## c. Bleeding

- (1) Heat - increase bleeding by dilating blood vessels  
(Extreme heat - decrease bleeding by increasing clothing)
- (2) Cold - decrease bleeding by contracting blood vessels

## 3. Types of hot and cold applications:

## a. Dry - less penetrating

## (1) Heat

- (a) Hot water bottle
- (b) Lamps and cradles
- (c) Heating pads

## (2) Cold

- (a) Ice caps
- (b) Ice collars

b. Moist - more penetrating

(1) Heat

- (a) Compresses
- (b) Wet dressings

(2) Cold

- (a) Compresses

#### 4. Demonstration

a. Demonstrate the methods of applying hot and cold compresses according to the following procedures.

b. Demonstrate the hot wet dressings according to the following procedures.

#### 5. Procedures

a. Hot compresses

(1) Assemble the equipment at bedside of patient:

- (a) Electric hot plate
- (b) Clean enamel pan
- (c) Sterile solution as ordered
- (d) Sterile 4 x 4's to be used as compresses
- (e) Towel
- (f) Rubber square

(2) Place pan with solution on electric hot plate. Heat to desired temperature.

(3) Place compresses in pan.

(4) Adjust hot plate to maintain desired heat.

(5) Protect bed with rubber square and towel if needed.

(6) Pick up two 4 x 4's with finger tips and press out most of solution. Apply to part as ordered.

(7) Change compresses by repeating step #6.

(8) Apply the compresses for the length of time as ordered - usually 15 minutes qh or q2h.

(9) If patient is able he may apply compresses.

b. Hot wet dressings

(1) Method #1

- (a) Dakins tubes, small rubber tubes with perforations, are placed in dressing at time it is applied. They are so placed that solution injected through

them will moisten all parts of dressing. Ends of the tubes are kept outside the dressing for convenience in injecting solution.

(b) To moisten dressing:

1. Take to bedside: Warm solution as ordered, sterile asepto syringe.
2. Test solution on back of hand.
3. Using syringe, inject solution into ends of tubes which are outside dressing.

(c) Moisten every three or four hours:

(2) Method #2

(a) To apply dressing:

1. Cover part with 4 x 4's.
2. Moisten with warm solution. Test solution on back of hand.
3. Cover with ABD pads.
4. Hold dressing in place with triangular or other type of easily removable bandage. Bandages on wet dressings should not be applied tight because of shrinkage, but must be firm enough to hold dressing in place.

(b) To moisten dressing:

1. Loosen bandage.
2. Lift ABD pads.
3. Moisten inner 4 x 4's by pouring solution from bottle. Test temperature on back of hand.
4. Reapply ABD pads and bandage.

c. Cold compresses

(1) Assemble the equipment at bedside of patient:

- (a) Enamel basin with ice.
- (b) 4 x 4's to use as compresses.

(2) Wring compresses with hands and apply to part as ordered.

(3) Change compresses by repeating step #2.

(4) Apply compresses for the length of time as ordered; usually 15 minutes qh or q2h.

(5) If patient is able he may apply compresses.

Training Notes:

1. Use student as a patient for demonstrations.
2. Explain that applications are to be carried out as ordered by the doctor.
3. Emphasize that wet dressings must be kept wet.
4. Stress importance of keeping the outside of the dressing dry.

Tenth Period - Three Hours  
Temperature, Pulse, and Respiration

Place: Classroom

References: "Principles and Practice of Nursing," Hunter and Henderson, Ch 10; TM 8-220, pars 197-199

Instructional Aids:

Personnel: One man to direct conference and demonstration; one projectionist; one man per eight (8) students to supervise applicatory work

Equipment: TF 8-1346; 1 projector and screen; 1 thermometer tray, complete; one enamel tray; eight clinical thermometers; one enamel cup with tincture of green soap; one enamel cup with Phenol 2%; one enamel cup with alcohol 70%; one enamel cup with water; one empty enamel cup 2 small paper bags; cotton balls; watch with second hand; and paper and pencil

Individual Equipment: Notebook and pencil; 1 thermometer tray, complete per every eight (8) students

16th, 17th, and 18th Hours - Conference, Demonstration, Application

Points to be Covered:

1. Introduction

a. The temperature, pulse rate, and respiration rate are so constant and regular in health that we speak of a normal temperature, pulse, and respiration. The mechanism governing them is so delicate that it responds immediately to any abnormal condition. Any marked change from normal is a symptom of disease. Thus, taking the temperature, pulse, and respiration is considered one of the principle means used to investigate a patient's physical condition.

b. In Army hospitals the temperature, pulse, and respiration are taken at intervals ordered by the medical officer. Unless otherwise ordered, it is taken in the morning and afternoon. This is a procedure frequently done by technicians.

## 2. Explanation

### a. Temperature

(1) **Definition:** The body temperature is its degree of heat; the balance between the heat production and heat elimination of the body.

(2) **Method for determination of body temperature.**

(a) **By mouth - usual method**

1. Normal temperature  $98.6^{\circ}$  F. (May vary depending on time of day and weather conditions.)
2. Subnormal temperature - below  $97.5^{\circ}$  F.
3. Elevated temperature or "Fever" -  $99^{\circ}$  F. or higher.

(b) **By rectum - occasionally used method**

1. Temperature by rectum usually is one degree higher than that by mouth.
2. Method used when temperature cannot be taken by mouth. Example: unconscious patient, very disturbed NP patient, young children.

(c) **By axilla - infrequently used method**

1. Temperature by axilla usually is one degree lower than that by mouth.
2. Method is used when temperature cannot be taken by mouth or rectum.

### b. Pulse

(1) **Definition:** The distention or pulsation of the arteries produced by the wave of blood forced through them by contraction of the left ventricle.

(2) **Points to observe about a pulse:**

(a) **Rate** - the number of beats per minute; varies with age, sex, activity, and disease; normal range adult male 65-80 beats per minute.

(b) **Rhythm** - the regularity with which the beats occur; regular in health; in disease may be irregular.

(c) Volume - the size of the blood stream which is pushed with each beat of the heart.

1. Increased - extra strong beats
2. Decreased - weak beats

c. Respirations

(1) Definition: Consists of an inspiration or inhaling air into the lungs, and an expiration or exhaling air from the lungs.

(2) Points to observe about respiration:

- (a) Rate - the number of respirations per minute; varies with age, activity, and disease; healthy adult 16 to 20 per minute.
- (b) Rhythm - the regularity with which the respirations occur; regular in health; in disease may be irregular.
- (c) Depth of each respiration - respirations are described as deep or shallow, depending upon whether the volume of inspired and expired air is greater or less than normal.
- (d) Ease of respirations - in health respirations occur with no conscious effort; in disease difficulty in breathing may occur; this is known as dyspnea.

3. Film TF 8-1346, "Temperature, Pulse, and Respiration." (15 minutes)

a. Synopsis: The importance of constantly checking temperature, pulse, and respiration of each patient is emphasized in this film. The use of a clinical thermometer, methods of taking pulse and respirations are demonstrated.

4. Demonstration

a. Demonstrate equipment for taking temperatures:

(1) The clinical thermometer

- (a) Consists of a glass bulb containing mercury and a stem in which the column of mercury may rise.
- (b) The stem is a graduated scale representing degrees of temperature.

1. Lowest - usually 94° F.

2. Highest - usually 110° F.

3. Normal line is usually indicated with arrow.

- (c) Once the mercury has risen in the stem it must be shaken down by a sweeping motion of the arm before the thermometer may be used again.
- (2) The thermometer tray: For convenience, equipment needed to take temperature and to clean thermometers is kept on a tray. This tray usually contains:
  - (a) Five enamel cups with: (Each cup must have cotton in bottom to protect tips of thermometers from breaking.)
    - 1. Tincture of green soap
    - 2. Phenol 2%
    - 3. Alcohol 70%
    - 4. Water
    - 5. Empty
  - (b) Eight thermometers
  - (c) Sputum box or paper bag for clean cotton
  - (d) Sputum box or paper bag for soiled cotton
- b. Demonstrate care of thermometers and thermometer tray.
- c. Demonstrate procedure for taking temperature.
  - (1) By mouth
  - (2) By rectum
  - (3) By axilla
- d. Demonstrate procedure for counting pulse.
- e. Demonstrate procedure for taking respiration.
- f. Demonstrate taking temperature, pulse, and respiration for a ward of patients.

## 5. Procedures

- a. Care of thermometer tray (procedure done in utility room)
  - (1) Clean all thermometers in tray
    - (a) Remove thermometers one by one from green soap solution.
    - (b) Wipe each thermometer with cotton swap using a firm twisting motion.
    - (c) Place thermometer in container with phenol 2% solution.
    - (d) Repeat steps "a" through "c" until all thermometers are in phenol solution.

- (e) Repeat steps "a" through "d" until all thermometers have been transferred from container with phenol 2% solution to container with alcohol 70%.
- (f) Repeat steps "a" through "d" until all thermometers have been transferred from container with alcohol 70% to container with water.
- (g) Repeat steps "a" through "d" until all thermometers have been transferred from container with water to dry container.
- (h) Shake thermometers down.

- (2) Remove clean thermometers from dry container and place on clean dry paper towel.
- (3) Empty all containers and discard cotton in bottom of containers.
- (4) Empty sputum cup or paper bag containing soiled cotton.
- (5) Wash all containers with warm soap and water.
- (6) Wash tray with warm soap and water.
- (7) Replace containers on tray.
- (8) Cover bottom of containers with cotton.
- (9) Label containers if necessary.
- (10) Refill containers with proper solutions.
- (11) Replace clean thermometers in dry container.
- (12) Change sputum cups or paper bags if necessary.
- (13) Refill sputum cup or paper bag with clean cotton.
- (14) Replace clean tray in proper place.

b. Care of rectal thermometer:

- (1) Thermometer for rectal use is kept in individual container with cotton in bottom and alcohol 70%.
- (2) When thermometer is no longer needed, remove thermometer and container from patient's unit.
- (3) Clean thermometer with cotton ball soaked with green soap using firm twisting motion.
- (4) Clean thermometer with cotton ball soaked with phenol 2%.
- (5) Clean thermometer with cotton ball soaked with alcohol 70%.
- (6) Place in emesis basin.
- (7) Cover with alcohol 70% and allow to remain in solution thirty (30) minutes.
- (8) Remove and rinse with cold water.
- (9) Wipe with clean dry cotton and shake down.
- (10) Replace with other clean thermometers on thermometer tray.

c. Temperature

- (1) By mouth

- (a) Place end of clean prepared thermometer containing mercury under patient's tongue. (Allow to remain in place three minutes)
  - 1. Instruct patient to keep lips together, to stop talking, or biting on thermometer.
  - 2. Instruct patient to remove thermometer before coughing or sneezing.
- (b) Remove thermometer from mouth, wipe with cotton, read, and place in container with green soap.
- (c) Record.
- (2) By rectum (actual temperature not to be taken by rectum in classroom)
  - (a) Use individual thermometer for each patient.
  - (b) Oil bulb before inserting into rectum.
  - (c) Insert thermometer.
  - (d) Allow to remain in place three minutes. (Do not remove hand from thermometer while it is in place)
  - (e) Remove, wipe with cotton, and place in individual container with alcohol 70%.
- (3) By axilla (actual temperature not to be taken by axilla in classroom)
  - (a) Bathe axilla (armpit) and dry carefully.
  - (b) Place thermometer so that mercury bulb is completely enclosed by body tissue.
  - (c) Allow to remain in position ten (10) minutes.
  - (d) Remove, wipe with cotton, and place in container with green soap.
  - (e) Record.

d. Pulse: Usually taken at wrist, but may be taken at temple, neck, or ankle.

- (1) Place the tips of three fingers over the artery, exerting just enough pressure to make the pulse most distinct. Never use the thumb.
- (2) After distinct beats can be felt, count number for thirty (30) seconds.
- (3) Multiply number counted by two (result is heart beats per minute).
- (4) Record.

e. Respirations: Observe patient for rise and fall of chest as air is inhaled and exhaled.

- (1) When complete breath can be observed, count number for thirty (30) seconds.
- (2) Multiply number by two (result is respirations per minute).
- (3) Record.

f. TPR for ward of patients:

- (1) Should allow one thermometer for each group of four patients.
- (2) Take thermometer tray to ward and place on bedside table or chair. (Never near radiator)
- (3) Pass clean prepared thermometers to six patients.
- (4) Return to first patient who was given a thermometer.
  - (a) Count pulse for thirty (30) seconds, and remember count.
  - (b) Without removing hand from pulse point observe respirations.
  - (c) Count respirations for thirty (30) seconds and remember count.
  - (d) Remove and read thermometer.
  - (e) Record TPR at one time. Record is made on one line in order, temperature, pulse, respiration. Example: 98.6 - 80 - 20
- (5) Repeat step #4 until the six thermometers have been collected.
- (6) Clean thermometers.
- (7) Repeat steps #1 through #6 until all TPR's have been recorded.
- (8) Clean thermometer tray and replace.
- (9) Report to nurse in charge immediately on completion of procedure any temperature above 99° F. and any abnormal pulses or respirations.

6. Application

a. Practice taking TPR on each other.

Training Notes:

1. Stress importance of TPR as objective symptoms of disease.
2. Stress that each student be able to take TPR accurately and make correct record of it.
3. Stress that procedure is not complete until tray has been cleaned and replaced.

Eleventh Period - Three Hours  
Diets and Trays

Place: Classroom

References: TM 8-500; "Principles and Practice of Nursing," Harmer and Henderson, Ch 13

Instructional Aids:

Personnel: One man as lecturer; two men to supervise applicatory work

Equipment: Blackboard; 2 trays; 2 knives; 2 forks; 2 teaspoons; 2 soup spoons; 2 dinner plates; 3 bread and butter plates; 1 cup; 2 salt shakers; 1 sugar bowl; 3 dessert dishes; 1 soup bowl; 4 napkins; 1 electric food cart; 1 drinkwater food cart; 2 drinking glasses; 1 saucer; 2 pepper shakers

Individual Equipment: Notebook and pencil; one set per student: 1 tray, 1 knife, 1 fork, 1 teaspoon, 1 soup spoon, 1 dinner plate, 1 drinking glass, 1 cup, 2 bread and butter plates, 2 dessert dishes, 1 soup bowl, 2 napkins, 1 salt shaker, 1 pepper shaker, 1 sugar bowl, 1 saucer

19th, 20th, & 21st Hours - Lecture, Demonstration, Application

Points to be Covered:

1. Introduction

- a. The normal diet: Contains the amount and proportion of each type of food to maintain full health and efficiency.
- b. Diet therapy: The use of foods in the treatment of disease.

2. Explanation

a. General

- (1) Food: Substances which, when taken into the body yield energy, build new tissue, repair old tissue, or play essential roles in growth and nutrition.
- (2) Calorie: The unit of heat. Food is measured by the amount of heat produced when it is used by the body, hence food is measured in calories.
- (3) Requirements: Vary with age, sex, disease, activity. Average soldier requires 3600 calories per day.

b. Nutritional elements

(1) Carbohydrates

- (a) Use - the body's main source of energy.
- (b) Caloric value - four (4) calories per gram, 1920 calories per pound.
- (c) Source:
  - 1. Starches - potatoes, bread, cereals
  - 2. Sugars - candy, sugar, fruit juices

(2) Proteins

- (a) Use - builds and repairs tissue
- (b) Caloric value - four (4) calories per gram
- (c) Source:
  - 1. Vegetable - cereal grains, leafy vegetables, nuts, beans, peas
  - 2. Animal - lean meat, fish and poultry, eggs, milk, and cheese

(3) Fats

- (a) Uses
  - 1. Body heat
  - 2. Energy
  - 3. Replace body fat
- (b) Caloric value - nine (9) calories per gram, 4320 calories per pound
- (c) Source: Butter, cream, fat meat, lard, and cheese

(4) Minerals

- (a) Use - necessary for proper maintenance and development of all body structures, especially bones, teeth, cartilages, and tendons.
- (b) Types - calcium, iron, iodine, phosphorous, common salt, and others. All in a very minute quantity.
- (c) Source - chiefly from green leafy vegetables, fruits, meats, milk, cooked whole grain cereals.

(5) Vitamins - small but highly concentrated group of substances needed to supplement other food elements.

- (a) Uses - necessary for general health and the proper utilization of carbohydrates and fats.
- (b) Deficiencies - result in lowered health, inefficiency and possibly greater liability to infection.

## (c) Types

1. A - found in green and yellow vegetables, butter, egg yolk, and cheese.
2. B - (Thiamin chloride) found in lean meats, whole grains, beans, and nuts.
3. Nicotinic acid - found in lean meats, whole grain cereals, and green leafy vegetables.
4. C - (Ascorbic acid) found in fresh fruits and vegetables.
5. D - found in fish oils. Produced by action of sunlight on the body.

## (6) Bulk

- (a) That part of vegetables and meats which the body is not able to digest.
- (b) Necessary to maintain muscle tone of intestines.
- (c) Forms the bulk of fecal material,

## (7) Water - most vital substance known

- (a) Normal requirements between two and three quarts per day. Normally regulated by thirst.
- (b) Force fluids
  1. Includes all liquids taken, but not water in other foods.
  2. Encourage patient to take fluids.
  3. Patients may have any liquids, not just water.
- (c) Limit fluids
  1. Ordered by doctor for patients with heart and kidney diseases.
  2. Includes all liquids taken during and between meals.

## c. Diet therapy

## (1) Purposes of diet therapy

- (a) To increase or decrease body weight.
- (b) To provide so called "ease of digestion."
- (c) To rest a particular organ.
- (d) To overcome deficiencies.
- (e) To adjust the diet to meet the ability of the body to use certain foods.
- (f) To produce some specific effect. Example: acidosis.

d. Types of diets

- (1) Regular or full - includes all types and preparations of food.
- (2) Light - adequate diet composed of easily digested foods. Avoid hot breads, pastries, fried foods.
- (3) Soft - adequate diet but food must be ground, strained or pureed.
- (4) Liquid - composed of fluids that are liquid when taken or are liquid when reach the stomach.
- (5) Special - meet a special need as to type of food or quantity of food.
  - (a) High calorie - given to increase body weight. Added carbohydrates and fats in the diet.
  - (b) Low calorie - given to decrease body weight. Reduced carbohydrates and fats in the diet.
  - (c) Bland - easily digestable foods low in bulk, not highly seasoned.
  - (d) Diabetic - weighed diet, no free sugar.
  - (e) Salt free - used in heart and kidney diseases. Food cooked without salt. Salt removed from tray.
  - (f) High vitamin - used to correct deficiency diseases.
  - (g) Others as ordered.
- (6) Nourishments - served between meals and in evening.
  - (a) If part of special diet - must be served. Not served to patients on special diet unless ordered.
  - (b) Serve milk, fruit juices, etc., as available.

e. Mess department

- (1) Physical set-up
  - (a) Patients' mess for ambulatory patients and food for patients on ward.
  - (b) Officers' mess.
  - (c) Detachment mess.
- (2) Personnel
  - (a) Mess officer - MAC, responsible for entire department.
  - (b) Mess sergeant - responsible for preparation and serving of food.
  - (c) Hospital dietitian - responsible for planning and preparation of all special diets.

f. Preparation and serving of trays

- (1) Ward kitchen

- (a) Stove for warming food, preparing eggs, etc., not for cooking.
- (b) Refrigerator for storing fruit juices, milk, butter, etc.
- (c) Trays
- (d) Shelves with dishes, silver, and glassware.
- (e) Sink for KP.
- (f) Table for preparing salads, etc.

(2) Mess cart

- (a) Property of ward, must be labeled.
- (b) Ward must keep it clean, take to mess at proper time, must be heated.

(3) Diet chart - list of all patients on the ward, their bed number, and their type of diet.

(4) Ordering food:

- (a) Ordered once a day - usually at 8 a.m.
- (b) List - prepared by nurse
  - 1. Number of each type of diet served on ward.
  - 2. Number of patients to mess hall.
  - 3. Amount of staple supplies needed.
- (c) Never over-order or "pad" - call dietitian if ward is not getting sufficient food.
- (d) Special orders during day telephone to dietitian.

(5) Rules for food handlers:

- (a) Use implements for handling food - tongs, spoons, forks, and other implements are provided on the wards - use them.
- (b) Be careful in handling of dishes - if broken save for salvage. Avoid use of cracked dishes.
  - 1. Do not put fingers on top of utensils.
  - 2. Hold cups by handles.
  - 3. Hold glasses by the bottom.
  - 4. Use clean towel or paper napkin to wipe food spilled or splashed.
- (c) Cover nose and mouth when sneezing or coughing.
- (d) Never eat food that is returned to kitchen on patients' trays.

(6) Serving trays - supervised by dietitian, nurse, or wardmaster.

- (a) Have spotlessly clean trays - clean trays and tray covers.

- (b) Have clean containers - sugar, salt, and pepper shakers should be kept clean and filled at all times. They should be set neatly at the back of the tray.
- (c) Use clean dishes and silverware - dishes and glasses sparkling and free of water spots, chips and stains; silverware should be clean and shining and free of tarnish and bends.
- (d) Serve hot food hot and cold food cold - plates and soup bowls should be heated before service starts; salad and dessert dishes chilled by placing in refrigerator for one (1) hour before serving.
- (e) Serve neatly and attractively - "spills" should be wiped off before sending the tray to the patient; the food should not be "thrown at" the plate.
- (f) Judge the appetite of the individual and serve accordingly - excessively large servings spoil appeal of the food for the patient with poor appetite.
- (g) Strict attention to special requests - much food will go uneaten if requests of "no mayonnaise" or "no gravy" are ignored.
- (h) Carry trays carefully - avoid spilling soup or beverage.
- (i) Give cheerful and willing service - seconds or forgotten items should be gotten willingly and promptly.
- (j) Remove empty trays promptly.

(7) Ward environment at tray time.

- (a) Clean, no bed pans or urinals.
- (b) Avoid doctor's rounds and dressings if possible.
- (c) Patients in comfortable position ready to eat.

(8) Feeding patients.

- (a) Place tray in position patient can see.
- (b) Do not rush patient.
- (c) If patient can use one hand assist as needed by buttering bread, cutting meat, etc.

3. Application - students set up trays for breakfast, lunch, and liquid diets.

Training Notes:

1. Stress wards responsibility in caring for mess cart.
2. Demonstrate equipment as it is explained.

3. Emphasize points to be observed in serving trays and handling food.

Twelfth Period - Three Hours  
Baths and Bathing

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, Ch 12

Instructional Aids:

Personnel: One officer; one enlisted man per eight (8) students to supervise applicatory work

Equipment: 1 patient unit; 1 pair pajamas; 5 sheets; 1 bar soap; 1 rubber draw sheet; 1 small bottle rubbing alcohol; 2 pillow cases; 1 small box powder; 1 bath towel; emesis basin; 1 hand towel; water glass; 1 wash cloth

Individual Equipment: One set per student:

1 bath towel      1 wash cloth

1 pair pajamas      1 hand towel

One set per every two students:

1 patient unit      1 small box powder

5 sheets      1 emesis basin; 1 bar soap

2 pillow cases      1 rubber draw sheet

1 water glass      1 small bottle rubbing alcohol

22nd, 23rd, & 24th Hours - Conference, Demonstration, Application

Points to be Covered:

1. Purpose of bath
  - a. To cleanse the patient.
  - b. To refresh the patient.
2. Time for bath - usually given in Army hospitals after breakfast.
3. Demonstrate the bath according to the following procedure.
4. Procedure
  - a. Preparation
    - (1) Assemble the equipment:
      - (a) Clean linen as needed.
      - (b) Alcohol and powder.

- (c) Bath basin with hot water
- (d) Emesis basin

- (2) Place clean linen on chair at foot of bed, other equipment on bedside table.
- (3) Get out patient's toilet articles, wash cloth, and towels.

b. Steps

- (1) Loosen top covers. Remove all except top sheet.
- (2) Remove pillow
- (3) Remove patient's pajamas
- (4) Brush patient's teeth
  - (a) Place face towel under patient's chin.
  - (b) Hold emesis basin at patient's chin.
  - (c) Raise head if necessary.
  - (d) Brush teeth and rinse mouth thoroughly.
  - (e) Clean toothbrush before putting away.
  - (f) If patient is able to brush his own teeth, assist him as needed.
- (5) Wash patient's face
  - (a) Protect bed under head with face towel.
  - (b) Wash the face and ears. Take care not to get soap in the eyes.
  - (c) Dry well.
- (6) Upper extremities
  - (a) Protect the bed under extremity with bath towel.
  - (b) Wash extremity of side away from you first.
  - (c) Wash arm and shoulder; pay special attention to underarm.
  - (d) Wash forearm and hand; clean nails.
  - (e) Wash extremity nearest you in same manner.
- (7) Chest and abdomen
  - (a) Bathe chest first.
  - (b) Bathe abdomen; special attention to umbilicus and hips.
- (8) Change water
- (9) Lower extremities
  - (a) Protect the bed under the extremity with the bath towel.
  - (b) Wash extremity on side away from you first.

- (c) Bathe thigh and knee.
- (d) Bathe lower leg and foot; note condition of skin between toes.
- (e) Bathe extremity nearest you in same manner.

(10) Back

- (a) Turn patient on side.
- (b) Protect bed with bath towel.
- (c) Bathe well, note pressure points - shoulders, hips, buttocks, and base of the spine.
- (d) Rub back with alcohol and powder.
- (e) Turn patient on back.

(11) Pubic region

- (a) Protect bed under buttocks with bath towel.
- (b) Bathe helpless patients carefully. Patients who are able may complete this part of the bath themselves.

(12) Put pajamas on patient

(13) Comb patient's hair

c. Follow up

- (1) Remake bed
- (2) Arrange area neatly with bed in line, bedside table neat and in proper place, chair in proper place.
- (3) Remove equipment and soiled linen. Clean and put away equipment.

5. Application (Assign 50% of students as technicians, 50% as patients)

a. Preparation

- (1) Patients dress in pajamas.
- (2) Students acting as technicians set up patient units and make unoccupied bed.

b. Students bathe patient, remake bed and rearrange unit.

c. Repeat steps "a" and "b" - patients become technicians; technicians, patients.

Training Notes:

1. Set up patient unit and make unoccupied bed for demonstration in advance.

2. Students dressed in pajamas act as patients for demonstration.
3. Stress the following points during demonstration:
  - a. Always protect the patient from unnecessary exposure.
  - b. Rinse soap off carefully after washing.
  - c. Change water as often as necessary.
  - d. Dry skin thoroughly, especially where two parts touch.
4. During applicatory exercise supervise closely; correct mistakes as they are made.
5. Emphasize the clean-up of the patient's unit after the bath is finished.

Thirteenth Period - Two Hours  
Oxygen Therapy

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson,  
Ch 28

Instructional Aids:

Personnel: One man to direct conference and give demonstration

Equipment: 1 patient unit; 3 sheets; 1 blanket; 1 pillow case; 1 rubber draw sheet; 1 pair pajamas; 1 oxygen tent, complete with tanks; 1 oxygen mask with tubing, gauges, and oxygen cylinders; 1 oxygen cylinder with gauges, humidifying bottle, tubing; 2 #10 catheters; 2 #12 catheters; 1 instrument sterilizer; ice

Individual Equipment: Notebook and pencil

25th and 26th Hours - Conference, Demonstration

Points to be Covered:

1. Introduction

- a. The purpose of oxygen therapy is to increase the amount of oxygen available in the air which the patient breathes.
- b. Reason for need to increase concentration of oxygen in the air:

- (1) High altitude - mountain climbers and aviators
- (2) Obstruction in the nasal passages
- (3) Decreased lung surface - pneumonia
- (4) Decreased oxygen in the blood

c. Oxygen therapy does not cure, but relieves patient only so long as he is receiving the therapy.

## 2. Explanation

a. Some conditions in which oxygen therapy may be indicated:

- (1) Asthma
- (2) Pneumonia
- (3) Cardiac disease
- (4) Empyema
- (5) Carbon monoxide poisoning
- (6) Asphyxia

b. Precaution in oxygen therapy: Oxygen does not burn but does support fire. No smoking is permitted in room with oxygen equipment.

c. Methods of administering oxygen:

- (1) Chamber: Especially built room air conditioned, with high concentration of oxygen. Very expensive - rarely used.
- (2) Tent: Complete compact portable air conditioning unit.

### (a) Advantages

- 1. Provides prescribed concentration of oxygen at most desirable temperature and humidity.
- 2. Most comfortable for patient.

### (b) In general an oxygen tent consists of:

- 1. Rubberized, air tight hood which fits over patient's head and covers upper half of bed. In the sides of the hood are celluloid windows which admit light and through which one may watch the patient. In each side there is an opening used for the administration of medicine and fluids, taking of temperature, etc
- 2. A large oxygen tank with valves and gauges.
- 3. An ice container for cooling the air.
- 4. A soda lime container for reducing the carbon dioxide content of the air.
- 5. A motor to keep the air in motion.

(3) Mask: Light gum rubber mask which fits over patient's nose or mouth and nose.

(a) Advantages

1. Simple equipment.
2. Can be set up in short time.
3. May be used when electrical power is not available.

(b) Consists of:

1. Nasal or oronasal mask, and a latex collecting bag with oxygen inlet valve and exhaust valve.
2. Oxygen tank with valves and gauges.
3. Humidifying bottle (not always used)
  - a. Glass bottle half filled with water.
  - b. Two (2) hole rubber stopper.
  - c. Two (2) pieces glass tubing.
4. Rubber tubing for connections.

(4) Nasal catheter

(a) Advantages

1. Simplest of all equipment.
2. Cheapest equipment.

(b) Consists of:

1. Nasal catheter - #10 and #12
2. Oxygen tank
3. Humidifying bottle as for mask
4. Rubber tubing for connections
5. Adhesive tape (to hold catheter in correct position)

d. Points to observe when operating equipment:

- (1) Keep extra cylinder of oxygen on hand.
- (2) Watch gauge - change cylinder before gauge registers empty.
- (3) Label empty oxygen tanks when removed.
- (4) Return empty oxygen tanks, do not let them accumulate on the ward.
- (5) Always "crack" oxygen cylinder before connecting to gauge.
- (6) Do not allow smoking in room.

- (7) Oxygen tent - do not allow ice level to fall more than six (6) inches below tent inlet, and do not allow drip pan to run over.
- (8) Do not attempt to regulate or adjust unless you understand the equipment and are familiar with the doctor's orders.

### 3. Demonstration

a. Demonstrate the mechanics of each type of equipment as they are explained.

b. Demonstrate the operation of the oxygen tent according to the following procedure.

c. Demonstrate the operation of the oxygen mask according to the following procedure.

d. Demonstrate the use of the nasal catheter to administer oxygen according to the following procedure.

### 4. Procedures

#### a. Oxygen tent

##### (1) To install:

- (a) When oxygen tent is ordered notify Central Service. A trained crew will bring equipment to ward and assist in installing.
- (b) Get two (2) buckets of ice.
- (c) "Crack" the oxygen cylinder by quickly opening and closing the valve. This blows out any dirt or other foreign material which might be in valve.
- (d) Attach gauge to cylinder.
- (e) Move apparatus to bedside and place parallel to patient's head.
- (f) Open valve on top of oxygen tank.
- (g) Plug in motor.
- (h) Place the hood over the patient's head. Tuck under mattress on both sides and head of bed. Allow for slack.
- (i) Regulate flow as ordered by doctor (six (6) liter of oxygen per minute should provide the patient with 50% oxygen.)

##### (2) After care of tent:

- (a) Scrub hood with soap and water.
- (b) Remove the ice, clean and dry compartment.
- (c) Return to Central Service.

b. Mask

(1) To install:

- (a) Secure equipment from Central Service.
- (b) Set gauge as ordered by doctor.
- (c) Attach mask to patient's face - adjust straps so that mask fits securely. Avoid having straps too tight.

(2) After care:

- (a) Clean mask with soap and water; dry.
- (b) Return to Central Service.

c. Nasal catheter

(1) To install:

- (a) Secure equipment from Central Service.
- (b) Attach tubing which is connected to oxygen cylinder to the long glass tube in the bottle (the one that extends down into the water).
- (c) Attach tubing which is connected to catheter to the short glass tube in the bottle.
- (d) Lubricate tip of catheter with lubricating jelly or mineral oil.
- (e) Insert catheter slowly for about three (3) or four (4) inches.
- (f) Anchor catheter in place with adhesive.

(2) After care:

- (a) Wash catheter thoroughly with cold water, soap and warm water, and boil three (3) minutes.
- (b) Return equipment to Central Service.

Training Notes:

1. Set up patient unit and equipment for demonstration in advance.
2. Stress danger of fire when using oxygen.
3. Demonstrate equipment as it is explained.
4. Emphasize technicians responsibilities in operation of oxygen equipment.

Fourteenth Period - One Hour  
Use and Care of Rubber Goods

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson,  
Ch 23

Instructional Aids:

Personnel: One man to direct conference and give demonstration

Equipment: 1 hot water bottle; 1 ice cap; 1 pillow case; 1 hand  
towel; 1 large enamel pitcher; 1 rubber ring; 1 hot  
water bottle cover

Individual Equipment: Notebook and pencil

27th Hour - Conference, Demonstration

Points to be Covered:

1. Introduction

a. Types of rubber goods used on ward.

- (1) Hot water bottle
- (2) Ice cap
- (3) Rubber ring

b. Source - Central Service

2. Explanation and demonstration

a. Hot water bottle

(1) Uses

- (a) General warmth
- (b) Relieve pain
- (c) To apply heat to a part to localize infection

(2) Procedure for filling

- (a) Fill the bottle 2/3 full of hot water. Test temperature of filled bottle as tolerated on inner side of forearm.
- (b) Remove the air - place the bottle on a table. Bring the level of the water to mouth of bottle and screw in stopper.

- (c) Dry. Test for leakage.
- (d) Cover with hot water bottle cover or towel.

(3) Procedure during use:

- (a) Refill every 2 to 3 hours.
- (b) Inspect area for redness to avoid burning.

(4) Care after use:

- (a) Drain all water from bottle.
- (b) Dry well.
- (c) Return to Central Service. (Store inflated so sides do not touch.)

b. Ice cap and ice collar

(1) Uses:

- (a) Check inflammation
- (b) Reduce swelling
- (c) Relieve pain
- (d) Check bleeding

(2) Procedure for filling:

- (a) Fill the ice cap about 2/3 full of finely cracked ice.
- (b) Remove the air by twisting the bag. Put on top, screwing it securely.
- (c) Dry with towel.
- (d) Cover with ice cap cover or towel.

(3) Procedure during use: Refill every 2 to 3 hours.

(4) Care after use:

- (a) Drain all water from ice cap.
- (b) Dry well.
- (c) Return to Central Service.

c. Rubber ring

- (1) Uses: To prevent pressure on local areas, mainly base of spine. (Doctor's order is not necessary)
- (2) Procedure:

(a) Preparation

- 1. Fill rubber ring 1/2 full of air or according to comfort of the patient.
- 2. Cover with pillow case.

- (b) Steps: Place under patient's buttocks in comfortable position.
- (c) Follow up:
  - 1. Clean with soap and water.
  - 2. Dry thoroughly.
  - 3. Return to Central Service. Inflate before storing.

Training Notes:

1. Emphasize that rubber goods must be covered before being used on patient.
2. Stress technician's responsibility in keeping hot water bags hot and ice caps filled with ice.
3. Stress that rubber goods should always be stored meticulously clean, dry, and inflated with air.
4. Stress deteriorating effect of grease and oil on rubber goods.

Fifteenth Period - Two Hours

: Enemas

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, 4th Edition, Ch 31; TF 8-1383, "Care of the Sick and Injured, Enemas" (20 minutes).

Instructional Aids:

Personnel: One man to act as demonstrator

Equipment: 2 rubber squares; 2 towels; 1 enema can with rubber tubing, clamp, glass connection, nozzle or rectal tube #28 to #30; 2 emesis basins; 2 tubes lubricating jelly; 2 bed pans with covers; 2 rolls toilet tissue; 1 I.V. standard; solution as required; 1 funnel; 1 rectal tube #16 to #18

Individual Equipment: Notebook and pencil

28th and 29th Hours - Film, Conference, Demonstration

Points to be Covered:

1. Definition: An enema is the injection of fluid into the rectum either to be expelled or retained.

2. Purpose

a. To be expelled:

- (1) To cleanse the lower bowel.
- (2) To relieve distention by helping to expell gas.

b. To be retained:

- (1) To give medication.
- (2) To give fluid.

3. Solution used:

a. As ordered by doctor.

b. Temperature 105 to 110 degrees F. (warm but not hot)

c. For cleansing:

- (1) Soap suds
- (2) Tap water
- (3) Normal saline

d. To relieve distention:

- (1) Tap water
- (2) Water and glycerine

e. To be retained:

- (1) Sedative medicine
- (2) Anesthesia
- (3) Nourishment

f. Quantity:

- (1) For cleansing usually 1000 cc, or as ordered.
- (2) To relieve distention usually 250 cc, or as ordered.
- (3) To be retained, as ordered by doctor. Small amount.

4. Demonstration

a. Demonstrate procedure for enema to be expelled and enema to be retained, except actual giving of treatment.

5. Procedure for enema to be expelled:

a. Assemble the equipment in the utility room. (As listed, using enema can with tubing, clamp, rectal tube #28 to #30.)

- b. Take equipment to bedside - screen bed if screens or curtains are available.
- c. Explain the treatment to the patient.
- d. Place irrigation can on standard 18 inches above bed, clamp closed.
- e. Pour solution into irrigation can.
- f. Place the patient flat in bed.
- g. Turn patient on his left side preferably, and move to edge of bed.
- h. Flex knees - right knee higher than left.
- i. Protect the bed by placing the rubber square covered with towel under the buttocks.
- j. Unfasten clamp and allow small amount of solution to run into bed pan to expell air from the tube.
- k. Lubricate tip of rectal tube or nozzle and insert slowly. Three (3) to five (5) inches into the rectum. (Allow at least ten (10) minutes for 1000 cc solution to flow into the rectum.)
- l. When the can is empty clamp off tubing.
- m. Remove rectal tube slowly and drop into emesis basin.
- n. Turn patient on back and move to center of bed.
- o. Place patient on bed pan. Place in comfortable position with light cord or bell within reach. Stay within call.
- p. After enema has been expelled give patient toilet tissue and assist as needed.
- q. Remove bed pan from under patient and cover it. Place bed pan on chair.
- r. Assist patient as needed to cleanse buttocks. Turn patient on side if necessary to completely clean buttocks.
- s. Remove towel and rubber.
- t. Wash patient's hands and make him comfortable.
- u. Take bed pan and equipment to utility room.

v. Observe contents of bed pan for amount, color, and consistency of stool. If any unusual contents, notify nurse before emptying bed pan.

w. Clean bed pan thoroughly and replace in bed pan rack.

x. Wash irrigation can and tubing with warm water; hang in place with clamp open, tubing wrapped around can. (Avoid kinks in tubing.)

y. Rinse rectal tube or nozzle in cold water, warm water and soap, and boil for three (3) minutes.

z. Report results to ward nurse.

6. Procedure for enema to be retained:

a. Assemble equipment in utility room. (Using funnel and rectal tube #16 to #18)

b. Take equipment to bedside - screen bed if screens or curtains are available.

c. Explain the treatment to the patient.

d. Place patient flat in bed.

e. Turn patient on his left side preferably, and move to edge of bed.

f. Flex knees - right knee higher than left.

g. Protect the bed by placing the rubber square covered with towel under the buttocks.

h. Lubricate rectal tube and insert slowly into rectum three (3) to five (5) inches.

i. Pour solution into funnel and allow to run slowly into rectum.

j. Remove rectal tube slowly and place in emesis basin.

k. Apply gentle pressure to anal region for few minutes with towel.

l. Turn patient on back and make him comfortable.

m. Leave towel and rubber sheet under buttocks for at least thirty (30) minutes to protect the bed.

n. Take equipment to utility room and cleanse thoroughly before putting away.

o. Report results to ward nurse after waiting thirty (30) minutes to be sure fluid has been retained.

Training Notes:

1. Emphasize enemata are not given without order from doctor or nurse.
2. Emphasize keeping patient screened and covered as much as possible during treatment.
3. Emphasize noting results of treatment.

Sixteenth Period - Two Hours  
Catheterization

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, 4th Edition, Ch 32

Instructional Aids:

Personnel: One man to act as demonstrator

Equipment: 1 manikin; 1 patient unit (1 extra bedside table); 1 screen; 1 urinal (glass if available); 1 emesis basin; 1 sterile forceps in solution in jar; 1 jar sterile lubricating jelly; 1 bottle tincture of green soap; 1 bottle bichloride of mercury solution 1-5000 or boric acid solution 5%; 1 sterile tray (obtained from Central Service) containing: 2 sterile towels, 2 hemostatic forceps (Kellys), 2 solution bowls, tongue depressors, medicine glass, 2 rubber catheters #16 and #18 French, sterile specimen bottle, cotton balls.

Individual Equipment: Notebook and pencil; 1 set of equipment as for demonstration per four (4) students

30th and 31st Hours - Conference, Demonstration

Points to be Covered:

1. Introduction and explanation

a. Definitions:

- (1) Catheterization is the introduction of a tubular instrument called a catheter, through the urethra into the urinary bladder, for the purpose of withdrawing urine.

- (2) Bladder irrigation is the washing out of the urinary bladder with a solution, through a catheter.
- (3) Instillation is the introduction of a small amount of sterile water or a medicated solution through a catheter into the bladder to be left in the bladder for at least thirty (30) minutes.

b. Types of catheters:

(1) Materials

- (a) Soft rubber
- (b) Silk
- (c) Linen
- (d) Metal
- (e) Glass

- (2) Size: Graded in size. Size to be used depends upon size and condition of urethra.

c. Purposes of catheterization:

- (1) Prevent over distention of bladder from any cause.
- (2) Relieve retention which exists when some abnormal condition interferes with mechanism of emptying.
- (3) Obtain urine specimens.
- (4) Periodic bladder drainage for injured patients who cannot void.

d. Dangers of catheterization:

- (1) Infection.
- (2) Perforation of urethra with undue pressure or lack of gentleness.

2. Demonstration

- a. Explain equipment and demonstrate how to set up equipment for use.
- b. Demonstrate procedure on manikin.

3. Procedure

a. Preparation

- (1) Assemble equipment at bedside.
- (2) Screen patient.

b. Steps

- (1) Inform patient as to procedure and reassure him.
- (2) Have patient be flat with hands clasped behind head.
- (3) Arrange equipment on tables so that it is easily within reach.
- (4) Fold top covers of bed to patient's knees.
- (5) Drape sterile towels away from pubic region (one above and one below).
- (6) Clean area with tincture of green soap (use cotton balls as sponges).
- (7) Clean area with bichloride of mercury solution or boric acid solution.
- (8) Place urinal in position to receive urine.
- (9) Put on sterile gloves and move sterile towels nearer to area.
- (10) Lubricate catheter, being sure that eye of catheter is open. Place distal end of catheter in urinal.
- (11) Hold penis at 60 degree angle to straighten urethra.
- (12) Insert catheter gently and withdraw urine slowly. Urine will begin to flow as soon as eye of catheter enters bladder.
- (13) Remove catheter slowly.

c. Follow up:

- (1) Replace equipment on bedside table and cover patient.
- (2) Remove screen.
- (3) Care of equipment:
  - (a) Clean all equipment and return to proper place.
  - (b) Return only Central Service equipment to Central Service.

4. Application

a. Students to set up equipment under supervision with correction and special attention to asepsis.

b. Students to practice steps with manikin.

Training Notes:

1. Emphasize need for aseptic technique.
2. Emphasize importance of gentleness in inserting catheter.

Seventeenth Period - One Hour  
Gastric Lavage and Gavage

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson  
 Ch 13 and 30

Instructional Aids:

Personnel: One man to direct conference and give demonstration

Equipment: 1 tray; 1 rubber square; 6 4 x 4's; 1 stomach tube each of #12, #14, and #16; 1 tube lubricating jelly; 1 enamel cup; 1 large enamel pitcher; 1 enamel tub; 2 hand towels; 1 pus basin; 1 enamel soup bowl; 1 30 cc syringe; 1 small funnel

Individual Equipment: Notebook and pencil

32nd Hour - Conference, Demonstration

Points to be Covered:

1. Gavage

a. Definition: A method of feeding a patient through a stomach tube; the tube may be inserted through the mouth or nose.

b. Purpose:

- (1) To feed mental patients who refuse food.
- (2) To feed unconscious patients.
- (3) To feed patients who have paralysis of muscles used in swallowing.
- (4) To feed patients with surgical conditions of mouth or throat which interfere with eating and swallowing.
- (5) To give medication to types of patients mentioned above.

c. Equipment:

- (1) Tray
- (2) Hand towel and rubber square
- (3) Emesis basin
- (4) Gauze squares
- (5) Levine tubes
- (6) Small enamel bowl for water
- (7) Lubricating jelly or mineral oil
- (8) Enamel bowl for ice water to chill tube
- (9) 30 cc syringe
- (10) Pitcher with liquid food as ordered
- (11) One (1) small funnel

d. Foods used in gavage: Any food which will pass through the tube.

- (1) Quantity: As ordered by the doctor; usually 1000 cc.
- (2) Sample formulae: Milk, eggs, karo syrup, yeast, tomato juice, cod liver oil, water.

(3) Preparation: Usually prepared by dietitian in central mess kitchen.

e. Procedure:

(1) Preparation:

- (a) Assemble the equipment on the tray.
- (b) Attach funnel to levine tube - cover tube with ice water.
- (c) Prepare food as ordered - warm to approximately body temperature.
- (d) Take equipment to bedside and place on bedside table.
- (e) Explain procedure to patient.

(2) Steps:

- (a) If possible, help patient to sitting position.
- (b) Place rubber and towel around patient's neck for protection.
- (c) Lubricate tip of tube; insert slowly through nose or mouth as ordered. As tube is being inserted, instruct patient to swallow and to breathe deeply. The black line, 16 to 18 inches from the tip, is a guide as to how far to insert it. (Do not insert in demonstration.)
- (d) Test to see that the tube has not passed into the trachea by holding the end of the tube into the small bowl of water. If it is in the trachea continuous bubbles of air will appear in the water, in which case the tube must be removed and reinserted.
- (e) Pour the food slowly into the funnel.
- (f) When the patient has received all the food remove the tube slowly and make the patient comfortable.

(3) Follow up:

- (a) Remove equipment to utility room.
- (b) Wash and dry enamelware.
- (c) Wash tube in cold water, warm water and soap, and boil for three (3) minutes.
- (d) Report results of treatment to nurse.

2. Lavage

a. Definition: The washing out of the stomach.

b. Purposes:

- (1) To cleanse the stomach after poison has been taken by mouth.
- (2) To cleanse the stomach of undigested food in acute gastric disturbances.
- (3) To relieve persistent vomiting.

c. Equipment:

- (1) Same as gavage, plus: 1 large tub or pail

d. Liquids used:

- (1) Water
- (2) Normal saline
- (3) Soda bicarbonate solution
- (4) Other solutions as ordered by doctor

e. Procedure:

- (1) Preparation: Same as gavage.
- (2) Steps:

- (a) Same as gavage in steps "a", "b", and "c".
- (d) Pour two (2) to three (3) glasses of fluid into tube, raise funnel until stomach is full, then lower it and let the fluid drain back through the tube into the tub or pail.
- (e) Repeat step "d" until the solution returns clear.
- (f) Remove tub. Make patient comfortable.

- (3) Follow up: Same as gavage.

Training Notes:

1. Do not pass the tube during the demonstration. Explain that the passing of the tube is done by the doctor or nurse.

2. Stress the technician's responsibilities:

- a. To assemble the equipment.
- b. Assist the doctor or nurse.
- c. Care for patient and equipment after treatment is completed.

Eighteenth Period - One Hour  
Aspiration of Body Cavities

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, Ch 29

Instructional Aids:

Personnel: One officer to act as lecturer

Equipment: Blackboard; American, Frohse Charts, Chest and Abdomen

Individual Equipment: Notebook and pencil

33rd Hour - Lecture

Points to be Covered:

1. Introduction

a. Aspiration: Removal of fluid.

b. Body cavities:

(1) True cavities: (No outside opening) Lined with serous membrane.

(a) Dorsal

1. Cranial

2. Spinal canal

(b) Ventral

1. Thoracic

2. Peritoneal

a. Abdominal

b. Pelvic

(2) Not true cavities: (Have outside opening) Lined with mucous membrane.

(a) Nasal

(b) Mouth

(c) Middle ear cavity

c. Fluid in body cavities:

(1) In health serous membrane which lines cavities is moistened by serum. Only small amount of fluid secreted and its absorption by lymphatics keeps pace with secretions.

(2) In disease amount may be considerably increased due to:

- (a) The extra activity of the irritated cells.
- (b) Increase in serum from the blood.
- (c) Decrease in absorption.

2. Explanation

a. Causes of increased fluid in body cavities:

- (1) Local inflammation.
- (2) Heart and kidney diseases.
- (3) Increased pressure on blood and lymph vessels - usually due to growth or injury.

b. Types of fluid:

(1) Fluid due to local inflammation:

- (a) May be serous (watery), or purulent (contain pus).
- (b) May contain white blood cells.
- (c) Usually contains organism causing the infection.
- (d) May contain blood.

(2) Fluid from blood and lymph vessels:

- (a) Pale yellow or greenish.
- (b) Few blood cells.
- (c) No bacteria.

c. Reasons for aspirating or removing fluid:

- (1) Aid in diagnosis.
- (2) Relieve pressure or tension.

d. Cavities from which fluid may be removed:

(1) Chest or pleural cavity.

- (a) Thoracentesis: Withdrawal of fluid from the pleural cavity.

1. Purposes: To remove fluid for diagnosis; also, to relieve pressure, pain, and dyspnea caused by:

- a. Diseases of heart or kidneys or by tumors of the chest which press on the large vessels.
- b. Bacterial infections such as tuberculosis.

## 2. Equipment:

- a. Thoracentesis set - sterile - usually obtained from Central Service, contains:
  - Thoracentesis needles - two
  - 20 cc syringe
  - Three-way stopcock
  - Test tubes
  - Gauze squares
  - Curved clamp
  - 2 cc syringe
  - Infiltration needles
  - Medicine glass
- b. Sterile rubber gloves.
- c. Sterile bottle for fluid - 1000 to 2000 cc
- d. Local anesthetic - usually procaine 1%.
- e. Sterile towels.
- f. Antiseptic solution.

## 3. Position of patient:

- a. Depends upon: comfort of patient; area to be punctured; convenience of doctor.
- b. Common positions: patient lying on unaffected side; patient in sitting position.

## 4. Dangers involved:

- a. Puncture of blood vessel.
- b. Puncture of lungs or diaphragm.
- c. Fainting or shock - result from sudden release of pressure.
- d. Infection.

## 5. Procedure:

- a. Preparation: Assemble the equipment; get patient into position as ordered by the doctor.
- b. Steps: Assist doctor as needed.
- c. Follow up: Make patient comfortable; specimen to laboratory; clean equipment with cold water, soap and warm water, and boil ten (10) minutes; chart procedure - time, amount, and type of fluid removed, condition of patient.

(b) Pneumothorax: Air in pleural cavity. Treatment used on patients with tuberculosis.

(2) Abdominal cavity - Abdominal paracentesis: The removal of fluid from the peritoneal cavity.

(a) Purpose:

1. To relieve pain and pressure.
2. To provide drainage.
3. To aid in diagnosis.

(b) Equipment:

1. Paracentesis set - sterile - usually obtained from Central Service.
  - a. Trachar and canula with rubber tubing
  - b. Test tubes
  - c. Gauze squares
  - d. Curved clamp
  - e. Two (2) cc syringe
  - f. Infiltration needles
  - g. Medicine glass
2. Scalpel, sterile.
3. Sterile towels
4. Sterile rubber gloves
5. Local anesthetic - usually procaine 1%
6. Dressing for wounds
7. Skin sutures to be used if needed
8. Antiseptic solution
9. Large tub for fluid

(c) Position of the patient: Depends upon the comfort of the patient and convenience of the doctor.

1. Seated in chair
2. Sitting on the side of the bed
3. Lying on side

(d) Dangers involved:

1. Puncture of bladder or other organs (Patient should always void before the treatment).
2. Shock due to the sudden release of pressure.
3. Infection.

(e) Procedure:

1. Preparation: Assemble the equipment; have patient void; prepare patient as ordered by the doctor.

2. Steps: Assist the doctor as needed.  
2. Follow up: Same as for thoracentesis.

(3) Other cavities:

- (a) Spinal: Lumbar puncture (covered in special class)
- (b) Ventricles of brain: Ventricular puncture (used only on neurosurgical patients)
- (c) Pericardium: Sac around heart (fluid rarely removed)
- (d) Middle ear: Aspirated frequently in children with otis media (infection of middle ear)

Training Notes:

1. Explain that these treatments are done by the doctor only.
2. Stress importance of sterile technique.
3. Emphasize the technician's responsibilities.
  - a. To assemble the equipment.
  - b. Assist the doctor.
  - c. Care for patient and equipment after treatment is completed.

Nineteenth Period - Two Hours  
Postoperative Bed

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, Ch 41

Instructional Aids:

Personnel: One man as demonstrator; one man per eight (8) students to supervise applicatory work

Equipment: 1 patient unit; bed; mattress; mattress cover; pillow; bedside table; chair; 4 sheets; 1 rubber draw sheet; 1 small rubber square; 1 pillow case; 1 blanket; 1 pus basin; mouth wipes

Individual Equipment: Notebook and pencil; one set of equipment as used for demonstration for each student

34th and 35th Hours - Conference, Demonstration, Application

Points to be Covered:

1. Introduction and explanation

a. Objectives of postoperative bed:

- (1) Covers arranged so that patient may be transferred easily from stretcher to bed and quickly covered.
- (2) Patients to be kept warm but not overheated.
- (3) Mattress protected from vomitus or drainage.

b. Economy of materials, time, and energy.

- (1) Assemble equipment before starting.
- (2) If patient's linen is not soiled it may be used.

2. Demonstration

a. Set up patient unit and make the postoperative bed according to the following procedure.

3. Procedure

a. Preparation

- (1) Assemble the equipment: 4 sheets, 1 rubber draw sheet, 1 pillow, 1 small rubber square, 1 blanket.
- (2) Place equipment on chair at foot of bed.

b. Steps

- (1) Put on bottom sheet, rubber draw sheet, and draw sheet as in unoccupied bed.
- (2) Place rubber square over bottom sheet at head of bed.
- (3) Fold extra sheet end to end and place over rubber square with open end at top. Tuck under mattress at top, miter corners, tuck under mattress at sides.
- (4) Place top sheet on bed as in unoccupied bed, but do not tuck in at bottom.
- (5) Cover top sheet with blanket. Fold sheet over blanket at head of bed.
- (6) Fold back top covers even with mattress at side of bed.
- (7) Tuck top covers under mattress on sides of bed opposite door of ward.
- (8) On side of bed toward door, fold top covers even with edge of mattress. Then fold again to middle of the bed.

c. Follow up

- (1) Move anything which might be in the way of the litter from side of bed nearest door.

(2) Place emesis basin and mouth wipes on bedside table.

4. Application

a. Students set up patient units and make postoperative beds.  
(Twice if time permits.)

b. Care of equipment

(1) Students fold and turn in linen.  
(2) Stack and count linen before it is dismissed.

Training Notes:

1. Stress avoiding unnecessary steps, moving from side to side of bed.
2. Assign only one student to a bed.
3. Supervise closely, correct mistakes as they are made.

Twentieth Period - Two Hours  
Care and Comfort of the Patient

Place: Classroom

References: "Essentials of Nursing," Young, Part I

Instructional Aids:

Personnel: One man to direct conference and demonstration; one man per ten (10) students to supervise applicatory work

Equipment: 1 patient unit with gatch bed; 3 sheets; 1 pillow case; 1 rubber draw sheet; 1 rubber pillow case; 1 small rubber square; 1 pair pajamas; 2 blankets; 1 hand towel; 1 bath robe; 1 bed pan; 2 bed pan covers; 1 urinal; 1 cradle; 1 pair bed rails; 1 wheel chair; 1 extra pillow.

Individual Equipment: One pair of pajamas per student.

One set per every two (2) students:

1 patient unit	1 bath robe
3 sheets	1 bed pan
1 pillow case	1 urinal
1 rubber draw sheet	2 bed pan covers
1 rubber pillow case	1 extra pillow
1 blanket	

One set per every six (6) students:

1 pair bed rails	1 cradle
1 wheel chair	

36th and 37th Hours - Conference, Demonstration, Application

Points to be Covered:

1. The Gatch Bed: Bed with springs made so that the head can be adjusted to any angle and the knees can be elevated and supported.

a. Use:

- (1) General comfort of the patient.
- (2) Lessen danger of hemorrhage after nose and throat operations.
- (3) To relieve difficult breathing.
- (4) To aid drainage after pelvic and abdominal operations. (Demonstration)

2. Bed Rails: Metal sides which may be easily slipped on and off bed.

a. Use: To keep patient from falling out of bed. (Doctor's order is not necessary for use.)

b. Source: Central Service. (Demonstration, Application)

3. Cradles: Metal or wooden frames used to elevate the covers and prevent pressure on feet, legs, or other parts of the body. (Demonstration, Application)

4. Pillows: To elevate patient's leg.

a. Indications:

- (1) Infection of leg
- (2) Cast on leg

b. Equipment:

- (1) 1 pillow
- (2) 1 pillow case
- (3) 1 rubber pillow case or small rubber square with towel
- (4) 1 cradle

c. Procedure:

- (1) Assemble equipment, bring to bedside and place on chair.
- (2) Put pillow case on pillow (rubber case if needed).
- (3) Turn back covers.
- (4) Place the pillow on bed beside the injured leg.
- (5) Support the leg by placing one hand under knee and one hand under ankle. Gently raise the leg.

- (6) Slip hand from ankle to knee joint supporting patient's leg on your arm. Hand that was under knee is now free.
- (7) With free hand draw pillow under leg and crease center of pillow.
- (8) Replace one hand under knee and one under ankle and place leg on pillow.
- (9) Put the cradle over the legs.
- (10) Remake bed (Demonstration, application).

5. Bed pans: Kept in utility room.

a. Procedure:

- (1) Cover bed pan with clean bed pan cover.
- (2) Take bed pan and toilet paper to bedside.
- (3) Assist patient on bed pan.
  - (a) If patient's condition permits, raise his head and shoulders and have him flex his knees.
  - (b) Support patient's lower back with one hand and help him to raise his buttocks.
  - (c) Slip the pan under the patient's buttocks with the other hand taking care not to scrape the skin.
  - (d) Adjust pan for the patient's comfort and proper protection of the bed.
- (4) Remove bed pan.
  - (a) Support patient's lower back with one hand and help him to raise his buttocks.
  - (b) Remove pan with the other hand.
  - (c) Cover the bed pan and place on chair.
  - (d) Cleanse the patient as needed. Dry thoroughly.
  - (e) Make patient comfortable.
- (5) Take bed pan to utility room.
- (6) Inspect contents of bed pan. Note about feces.
  - (a) Amount
  - (b) Solid-semi, solid, liquid
  - (c) Color-claycolor, black, tarry
- (7) If contents abnormal notify nurse before cleaning the bed pan.
- (8) Clean bed pan.
  - (a) Empty in hopper.
  - (b) Clean thoroughly with cold water.
  - (c) Cleanse with bed pan brush.
  - (d) Scald, dry, and place in rack.

(9) Precaution:

- (a) Never take soiled, improperly washed bed pan to bedside.
- (b) Never take uncovered bed pan through ward.  
(Demonstration, Application)

6. Urinals: Kept in utility room.

- a. Cover with bed pan covers.
- b. Remove promptly to avoid spilling contents in the bed.
- c. Do not leave urinal at bedside or on bedside table.
- d. If anything abnormal is noted report to nurse before emptying urinal.

e. To cleanse:

- (1) Rinse well with cold water and then with hot.
- (2) Stains can be removed with weak solution of hydrochloric acid or chlorine and brush.
- (3) All bed pans and urinals should be boiled at least once a day for twenty (20) minutes in the bed pan sterilizer. (Demonstration, Application)

7. The Wheel Chair

a. Equipment:

- (1) Wheel chair
- (2) Two blankets (depending upon weather)

b. Procedure:

- (1) Put bath robe on patient.
- (2) Place chair at the foot of the bed, at right angle to the bed and facing it.
- (3) Place one blanket folded crosswise across the back of the chair with the fold at the top to place around patient's shoulders.
- (4) Unfold second blanket and place it crosswise across lower part of chair.
- (5) Have patient sit on side of bed facing chair. Put on shoes or slippers.
- (6) Assist patient to stand and turn.
- (7) Place one hand under patient's arm and shoulder for support and with other hand hold back on wheel chair.

Training Notes:

1. For application - 50% of students act as technicians; 50%, as patients. After technicians have practiced each procedure patients act as technicians and technicians as patients.
2. Supervise closely, correcting mistakes as they are made.
3. Stress gentle handling of patients.

Twenty-first Period - Two Hours  
Fracture Bed and Other Orthopedic Appliances

Place: Classroom

References: "Orthopedic Nursing," Funstein and Caldewood, Units 2 and 6

Instructional Aids:

Personnel: One man to direct conference and demonstration; two (2) men to assist with demonstration

Equipment:

1 Thomas splint with Pearson attachment	
2 rolls bandage, elastic, self-adherent	
1 small bottle tincture of green soap	
1 Balkan frame complete attachment	
1 patient unit	1 fracture bed
2 rolls 2" adhesive	3 blankets
10 sheets	12 feet window cord
4 pillows	1 pair pajamas
Weights	1 razor and blades
4 hand towels	1 doz safety pins
2 bath towels	1 doz 4 x 4's
1 bottle ace adherent	

Individual Equipment: Notebook and pencil; non-standard diagram

38th and 39th Hours - Conference, DemonstrationPoints to be Covered:

## 1. Introduction

## a. Review of types of fractures:

- (1) Simple: Bone is broken, but skin and surrounding tissue are not broken.
- (2) Compound: Bone broken and has protruded through the skin and surrounding tissue.
- (3) Comminuted: Bone is crushed.

b. Review of treatment of fracture: To heal the parts must be in proper line.

(1) Reduction or setting:

(a) Definition: Moving distal fragment into line with controllable fragment.

(b) Methods:

1. Manual manipulation: Moving fragments into place with the fingers.

2. Traction: Two parts moved into place by exerting a slow steady pull on the two parts.

3. Open treatment:

a. Use: Resorted to if satisfactory reduction cannot be made and maintained by frame method.

b. Methods: Incision and internal fixation.

(2) Immobilization:

(a) To hold in place - necessary following reduction.

(b) Methods:

1. External fixation:

a. Casts

b. Traction

c. Splints and bandages

2. Internal fixation:

a. Screws

b. Nails

c. Bolts

d. Inlay of bone

2. Explanation and demonstration

a. Fracture bed (none for demonstration)

(1) Firm flat bed.

(2) Canvas straps across metal frame work.

(a) Each strap tightened with special device at side.

(b) May be lowered in sections.

b. Fracture boards (demonstrate): Used when a fracture bed is not available. Wood plank placed on springs under mattress to prevent mattress from sagging.

## c. Balkan frame (demonstrate)

## (1) Types:

- (a) Metal
- (b) Wooden - made with 1" x 2" boards; can be held to any bed with clamps.

## (2) Uses:

- (a) Stands over bed to serve as support for attachments used to apply traction.
- (b) Support for trapeze used by patients in moving.

## d. Casts (review)

## (1) Uses:

- (a) To maintain position of a reduced fracture.
- (b) To enforce rest of a part.
- (c) To relieve pain by immobilization.
- (d) To prevent deformity.
- (e) To correct deformity.

## (2) Applied in operating room, plaster room, rarely on wards.

## e. Traction

## (1) Types of traction:

- (a) Skeletal - bone used to anchor traction.

1. Types (demonstrate equipment):

- a. Pin driven into the bone - Steinman Pin.
- b. Drill hole into bone and insert wire - Kirschner Wire.
- c. Ice tong caliper (used for fractured neck)

2. Insertion of appliances for bone traction must be done in operating room using aseptic technique.

- a. Avoid bone infection.
- b. Give anesthetic, local or general.

- (b) Skin traction - heavy adhesive or moleskin applied to skin; traction applied.

1. Advantages:

- a. Less danger of infection.
- b. Less equipment needed.
- c. Used when patient is not in condition for surgery.

1. Disadvantages:

- a. Adhesive or moleskin slips.
- b. Skin rash may occur under adhesive.

(2) Demonstration (use student as patient)

(a) Demonstrate procedure for putting patient with fractured femur into traction - skin traction using Thomas splint with Pearson attachment. Explain principle of traction. Explain method used to apply traction for fractures of other bone.

Training Notes:

1. Emphasize technician assembles equipment to place patient in traction on ward.
2. Emphasize that medical officer applies the traction with aid of technicians.

Twenty-second Period - Three Hours  
Hypodermics

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, Ch 27

Instructional Aids:

Personnel: One projectionist; one man to direct conference and demonstration; one man per six (6) students to supervise application

Equipment: Screen and projector; TF 8-1266; Placebo tablets; 1 instrument sterilizer; hypodermic tray, complete with sterile distilled water, 50 cc; alcohol lamp; container with sterile 2 cc syringes; sterile pick-up forceps in sterilizing solution; container for waste; container with sterile hypo needles; container with alcohol sponges; matches; emergency medications.

Individual Equipment: One hypo tray, complete, for every two (2) students; One instrument sterilizer per ten (10) students; Notebook and pencil

40th, 41st, and 42nd Hours - Lecture, Demonstration, ApplicationPoints to be Covered:

## 1. Introduction

a. Definition: The introduction of a small amount of a liquid into the subcutaneous tissues with a needle and syringe.

b. Importance to technician: This is a common method of giving medication and it is frequently the responsibility of the technician to:

- (1) Prepare the hypodermic.
- (2) Give the injection.
- (3) Care for the equipment.

## 2. Explanation and uses

a. When an immediate effect from the drug is desired.

b. When the patient's condition does not permit the drug to be given by mouth.

c. When the drug is rendered ineffective by the action of the digestive juices.

## 3. Demonstration

a. Demonstrate equipment:

- (1) Hypodermic tray; a small tray, containing:

(a) Covered sterile container with:

1. 2 cc syringes

a. Parts - barrel or outside part; plunger or inside part.

b. Two parts of syringe must match. Check by number on side of each part.

2. Alcohol 70% to cover all parts of syringes.

- (b) Covered sterile container with hypodermic needles.
- (c) 50 cc bottle sterile distilled water.
- (d) Container of sterile cotton sponges in alcohol 70%.
- (e) "Pick up" forceps in container with Army Sterilizing Solution.

- (f) Table spoon.
- (g) Alcohol lamp and matches.
- (h) Bowl for waste.

(2) Medication as ordered by the doctor:

- (a) Box or vial of tablets.
- (b) Ampule.

b. Demonstrate steps in preparing and giving hypodermic:

(1) Preparation:

- (a) Select medication as ordered by doctor - check drug, dose, and name of patient carefully.
- (b) Place hypo tray (kept in nurses' office) in convenient position to prepare hypodermic.
- (c) Remove covers from containers of syringes, needles, and cotton balls.
- (d) With finger tips take alcohol sponge from container and place on rubber stopper of sterile distilled water.
- (e) Using "pick up" forceps:

1. Take sterile barrel of syringe from container and place in left hand taking care not to contaminate either end of barrel.
2. Take matching plunger from container and insert into barrel.
3. Take needle from container and place on top of barrel.

- (f) Replace "pick up" forceps in solution..
- (g) With finger tips take alcohol sponge from container and place around needle.
- (h) Put assembled syringe and needle on tray.
- (i) Replace covers on containers of syringes, needles, and alcohol sponges.
- (j) Light alcohol lamp.
- (k) Remove approximately 25 minims of sterile distilled water from the bottle in the following manner:
  1. Withdraw plunger of syringe approximately 25 minims.
  2. Insert needle through rubber stopper of bottle and inject air into the bottle.
  3. Holding bottle upside down withdraw water.
  4. Withdraw needle from stopper.

(l) Expell water from syringe into spoon.

- (m) Place syringe and needle on tray covering needle with alcohol sponge.
- (n) Bring water in spoon to a brisk boil over alcohol lamp.
- (o) Withdraw 15 minims of the boiled water into the syringe and discard the remainder.
- (p) Place tablet in spoon and dissolve by expelling the water from the syringe into the spoon and drawing it back into the syringe two or three times.
- (q) Draw prepared solution into the syringe and place alcohol sponge over needle.

c. Administration

(1) Site of injection:

- (a) Usually the outer surface of the upper arm.
- (b) Thighs or buttocks or any less sensitive fleshy part of the body.

(2) Preparation of the skin: Clean the area with alcohol sponge which was on the end of the needle.

(3) Technique for injecting:

- (a) Grasp the part in the left hand holding it so the skin is taut.
- (b) Hold the syringe between the 1st and 2d fingers of the right hand with the thumb on the plunger. With the needle uppermost push the plunger in until all air is removed.
- (c) Holding the syringe at an angle to the part with a quick sure stroke insert needle into the tissue under the skin.
- (d) Place the alcohol sponge over point of injection and remove needle.
- (e) Gently massage area with the alcohol sponge.

d. Care of equipment

- (1) Rinse syringe and needle with water.
- (2) Boil syringe and needle for ten (10) minutes.
- (3) Using sterile forceps, return syringe and needle to container on hypodermic tray.
- (4) Clean and replace tray.

f. Charting procedures

- (1) Report to nurse - time, drug, dose, and name of patient.

(2) Narcotics, penicillin, and streptomycin must be charted in special books.

#### 4. Application

a. Students divide into groups of two. Each student prepares, gives hypodermic, and resterilizes equipment after use.

#### Training Notes:

1. Emphasize that technicians give medications by hypodermics only on direct order of doctor or nurse.
2. Emphasize need for care of equipment.
3. Supervise closely; correct mistakes in technique as they are made.

#### Twenty-third Period - Two Hours Isolation Technique

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, pages 158-173; TM 8-220, par 232

#### Instructional Aids:

Personnel: Two (2) men to act as demonstrators; one (1) man per eight (8) students to supervise application

Equipment:

1 patient unit, complete, with bed made;	
2 sheets to hang as curtains around bed to form cubicle;	
2 tables (one for hand solution, one for gowns);	
1 waste basket	2 basins
1 soap dish	1 bar of soap
1 bottle antiseptic solution (70% alcohol)	
1 mouth thermometer	1 bottle (thermometer holder)
1 mask	1 gown
kleenex	1 paper bag
50 feet of wire	25 safety pins
1 clothes rack	1 bucket (for discarded masks)

Individual Equipment: Notebook and pencil

43rd and 44th Hours - Conference, Demonstration

#### Points to be Covered:

1. Explanation

a. Definition: Isolation technique means the method of applying and enforcing segregation.

b. Isolation may be accomplished by:

- (1) Separate hospitals
- (2) Separate wards
- (3) Disease units, for two or more patients with the same disease.
- (4) Patient unit or individual isolation unit.

c. Purpose of isolation technique is to prevent spread of communicable disease from patient to other patients or hospital personnel.

d. Underlying principle: To keep all organisms of that disease within the unit and destroy organisms on equipment which leaves the unit.

## 2. Demonstration

a. Demonstrate set-up of isolation unit on a ward.

b. Demonstrate procedure for entering the isolated unit, giving a patient a drink of water, and leaving the unit.

## 3. Set-up of isolation unit

a. Standard patient unit with bed made.

b. Paper bag for waste pinned to sheet and mattress at head of bed on right side of patient.

c. On bedside table:

- (1) Thermometer in bottle of alcohol
- (2) Kleenex
- (3) Drinking glass with water

d. Wires strung across ward on both sides of bed.

e. Sheets pinned to wire on both sides of bed to form cubicle.

f. Table outside unit on left with:

- (1) 1 basin of water
- (2) 1 soap dish with bar of soap
- (3) 1 basin of antiseptic solution
- (4) Paper towels

- g. Waste basket beside table.
- h. Clothes rack beside table.
- i. Table outside unit on right with:
  - (1) Clean gowns
  - (2) Clean caps
  - (3) Clean masks

- j. Bucket for discarded masks.

4. Procedure for demonstration #2:

- a. Put on clean mask and gown before entering cubicle.
- b. Enter cubicle, assist patient to take a drink of water, replace drinking glass on bedside table.
- c. Leave cubicle.
- d. Untie gown at waist.
- e. Push sleeves of gown up slightly and wash hands with soap and water. Immerse hands in antiseptic solution. Dry hands with paper towel and discard towel in waste basket.
- f. Carefully touching only neck of gown untie and loosen at neck.
- g. Remove gown by sliding fingers under cuff of sleeve and pulling cuff over hands. Slide arms out of sleeve.
- h. Fold gown as it is removed with outer surface of the gown on the inside putting both sleeve holes together.
- i. Hang gown on clothes rack by shoulder seams.
- j. Remove mask, touching only strings, and discard.

Training Notes:

- 1. Stress care in not contaminating hands when removing gown or mask.
- 2. Emphasize not removing any contaminated article from unit without measures for disinfection.

Twenty-fourth Period - One Hour.  
Prevention of the Transmission of Communicable  
Diseases in the Hospital

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson,  
Ch 7

Instructional Aids:

Personnel: One officer to act as lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

45th Hour - Lecture

Points to be Covered:

1. Introduction

a. In the care of every patient, hospital personnel should use strict cleanliness in regard to linen, dishes, and equipment which come in contact with the patient. When caring for patients with communicable or contagious diseases it is not sufficient that the patient's equipment be clean; special precautions must be taken to protect other patients and hospital personnel from the disease. Since the technician will work with patients with communicable diseases he should know how to protect himself and others.

2. Explanation

a. Means by which infections enter the body:

- (1) Through respiratory tract by inhaling droplets from sneezing, coughing, or talking.
- (2) By the alimentary tract through food or water.
- (3) Through the skin by the bite of insects.
- (4) Through breaks in the skin or mucous membrane.

b. Methods by which infections are transmitted:

- (1) By direct contact with the infected patient:
  - (a) Inhalation of droplets from sneezing, coughing, or talking.
  - (b) By contact with discharges of the body such as sputum, urine, feces, or nasal secretions.

(2) By indirect contact:

- (a) By contaminated food or water.
- (b) By contaminated hands of ward personnel.
- (c) By flies or dust.
- (d) By linen, dishes, instruments, or utensils which have become contaminated.
- (e) By the bite of insects such as mosquitoes or fleas.

(3) By disease carrier: A person who has the organism of a disease in his body but does not have the disease.

c. Isolation: The means by which we attempt to separate the infected patient from all contacts with other non-infected patients and the public.

(1) Methods of isolation:

- (a) Separate hospitals
- (b) Separate wards
- (c) Disease units - for two or more patients with the same disease.
- (d) Patient unit

(2) Objective of medical asepsis: In medical asepsis the objective is to keep the contamination within a definite area. In contrast to surgical asepsis in which the objective is to prevent contamination of a definite area.

(3) General rules to observe in caring for isolated patients:

- (a) Keep hands away from your face and clothing.
- (b) Do not eat anything or smoke within the patient unit.
- (c) Avoid having patient cough or sneeze in your face.
- (d) Always wear gown if ordered by doctor. If gown becomes wet, torn, or contaminated, discard it and put on a clean gown.
- (e) Wear mask if ordered by doctor. Usually ordered for infections which enter the body through the respiratory tract.
- (f) Scrub hands thoroughly after contact with patient or contaminated equipment.
- (g) Take measures to disinfect any equipment which is removed from contaminated unit.

(4) General methods of disinfection. These will vary depending upon facilities available.

- (a) Dishes, glassware, and enamelware - usually disinfected by boiling.

- (b) Bed pans and urinals - usually boiled.
- (c) Soiled linen - autoclaved.
- (d) Patient's clothing - exposed to air and sunlight.
- (e) Drainage, dressings, left over food - placed in clean paper bag and burned.

(5) Visitors - rules vary with hospital. If permitted to enter patient's unit, isolation precautions must be explained to them and practiced by them within the unit.

(6) Disinfection - after patient recovers:

- (a) Room aired
- (b) Walls, floor, and furniture scrubbed
- (c) Mattress and pillows aired
- (d) Blanket aired and washed
- (e) Other equipment cared for as explained above

Training Notes:

1. Emphasize that isolation measures are ordered to prevent the spread of infection to other patients and ward personnel.
2. Stress that steps must be taken to disinfect all equipment which leaves the contaminated area.
3. Emphasize complete disinfection of unit after patient recovers, before unit is used again.

Twenty-fifth Period - Two Hours  
Nursing Care of Communicable Diseases

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, Ch 43.

Instructional Aids:

Personnel: One officer to act as lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

46th and 47th Hours - Lecture

Points to be Covered:

1. Introduction

a. The comfort and recovery of patients suffering with communicable diseases is often dependent upon the nursing care which they receive. Since the technician will be caring for these patients, he should be familiar with the general principles concerning their care.

## 2. Explanation

### a. General principles underlying the care:

- (1) The comfort of the patient.
- (2) Observation and reporting of signs and symptoms.
- (3) The relief of unpleasant symptoms.
- (4) Carrying out the various treatments prescribed.
- (5) Prevention of the spread of the disease to others.

### b. Points which may accompany all communicable diseases:

- (1) These diseases are usually accompanied by fever.
- (2) These diseases are usually accompanied by more or less toxémia.
- (3) These diseases are frequently accompanied or followed by complications.
- (4) The duration of the disease is not greatly lessened by treatment, although the acuteness and the complications are greatly affected by prompt and continuous treatment.

### c. General nursing measures:

- (1) Rest - comfortable bed, avoid unnecessary noise and bright lights, room well ventilated.
- (2) Care of skin:
  - (a) Measures to prevent pressure sores with all patients.
  - (b) In diseases accompanied by skin eruption:
    1. Prevent patient from scratching.
    2. Calomine or other lotion for itching as ordered by doctor.
    3. No alcohol rubs.
    4. Keep patient and bed linen clean.
    5. Avoid over-heating of patient if possible.
- (3) Oral Hygiene: Keep mouth and teeth clean. If patient unable to brush own teeth, give frequent mouth care.
- (4) Care of ears: Ear infections are frequent complications of upper respiratory diseases. Examine frequently. Report any swelling, redness, tenderness, discharge, or complaint of pain.

(5) Care of eyes: In diseases where the secretions of the eyes are increased, the eyes should be cleaned frequently enough to keep them free from discharge.

(6) Elimination:

- (a) Avoid constipation - check bowel movements daily.
- (b) Keep careful accurate record of urine output if ordered.

(7) Diet:

- (a) Diet ordered by doctor will depend upon the disease and the condition of the patient.
- (b) Encourage patient to take diet and fluids.

d. Signs and symptoms to observe and general measures for relief:

(1) Temperature:

- (a) Report any variation of temperature of 1° or more, whether increasing or decreasing.

(2) Headache:

- (a) Room well ventilated.
- (b) Ice bag to head.
- (c) Medication as ordered - usually given by nurse.

(3) Restlessness and insomnia:

- (a) Bed dry and free from wrinkles.
- (b) Room well ventilated.
- (c) Patient free from worry - reassure him.
- (d) Warm drinks if permitted.
- (e) Sedative as ordered - usually given by nurse.

(4) Increase in pulse rate, abdominal pain, chest pain, other complaints - report to nurse immediately. They may be signs of complications.

(5) Coughing - cough medicine as ordered.

(6) Itching - lotions and baths as ordered.

#### Training Notes:

1. Emphasize general principles underlying the care of patients with communicable diseases.

2. Stress the importance of good nursing care in lessening the discomfort of the disease and lessening danger of complications.

Twenty-sixth Period - One Hour  
Nursing Care of Tropical Fevers

Place: Classroom

References: "Essentials of Medicine," Emerson, Ch 31 and 32

Instructional Aids:

Personnel: One officer to act as lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

48th Hour - Lecture

Points to be Covered:

1. Introduction

a. Since large numbers of soldiers were stationed in tropical areas during the war the number of patients in Army hospitals with tropical fevers was high. Although the number has greatly decreased since the war ended the Army hospitals in the tropics, in the southern part of the United States, and those serving troops returning from the tropics are still caring for patients suffering with tropical fevers. Since the technician may work in a hospital in one of these areas, he should be familiar with the nursing care of these patients.

2. Explanation

a. Malaria

- (1) Bed rest at onset of chill and as long as fever continues.
- (2) Give medication regularly as ordered by doctor.
- (3) Keep patient warm and dry - change bed as needed when temperature begins to drop, but avoid chilling the patient.
- (4) Report chills.
- (5) Take temperature at frequent intervals (at least every thirty (30) minutes) following chill until it falls to 100°.
- (6) Force fluids.

b. Dysentery

- (1) General nursing measures.
- (2) Report anything unusual about feces before emptying bed pan; i.e., blood, etc.

- (3) Collect stool specimens as ordered by doctor.
- (4) Take stool specimens to the laboratory immediately. They must be examined while warm.

c. Dengue

- (1) Bed rest
- (2) Liquid or light diet as ordered
- (3) Force fluids
- (4) Alcohol rubs for fever
- (5) Watch for signs of hemorrhage from nose, stomach, or bowels.

d. Yellow Fever

- (1) Bed rest
- (2) Measures to relieve vomiting which is frequently present.
- (3) Observe urine output, both quantity and for presence of blood. Kidney damage is a common complication. Save any unusual specimen.

e. Cholera

- (1) Observe strict isolation precautions as ordered by doctor. (Highly contagious spread by discharge from genito-intestinal tract - feces and vomitus).
- (2) Note signs of dehydration:
  - (a) Force fluids.
  - (b) Carry out doctor's orders concerning I.V. fluids.
- (3) General nursing measures to keep patient comfortable.

Training Notes:

- 1. Emphasize that patient's recovery may depend upon the observation and prompt reporting of signs and symptoms.
- 2. Stress importance of general nursing measures for the comfort and welfare of the patient.

Twenty-seventh Period - Two Hours  
Preoperative and Postoperative Care

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, Ch 40 and 41

Instructional Aids:

Personnel: One man to direct conference and demonstration;  
one man to assist with demonstration

Equipment:

1 patient unit	1 roll adhesive
8 sheets	6 ABD pads
2 pillow cases	1 pus basin
1 pair pajamas	2 blankets
1 thermometer tray, complete	1 rubber draw sheet
1 wheel litter with pad	1 small rubber square

Individual Equipment: Notebook and pencil

49th and 50th Hours - Conference, Demonstration

Points to be Covered:

1. Preoperative care: Care given the patient before operation.  
Begins the day patient is admitted to the hospital.

a. Mental attitude of patient.

- (1) Aid in overcoming fear or anxiety.
- (2) Inspire confidence in care which he will receive.

  - (a) Expert physical care.
  - (b) Interest in patient's personal problems.

b. Physical

- (1) Examination made by doctor.
- (2) Extent of examination:
  - (a) Depends upon patient's condition and type of operation.
  - (b) Heart and lungs always examined.

c. Immediate preoperative orders.

- (1) Left by doctor - usually afternoon before operation.
- (2) Nurse will instruct technician in his responsibilities.
- (3) Sample orders:
  - (a) For operation in a.m.
  - (b) Prepare entire abdomen.
  - (c) Nothing by mouth after 12 midnight. Purpose - avoid aspirating food.
  - (d) S.S. enema at 2100 hours. Purpose - intestines are free from gas and fecal material.

- (e) Nembutal 0.1 Gm at H.S. Purpose - to insure nights sleep.
- (f) Morphine 0.016 Gm. (Atropine 0.0006 Gm.) at 0830 hours.
  - 1. Morphine quiets patient and makes the induction stage of anesthetic go more smoothly.
  - 2. Atropine
    - a. Dries up secretions and lessens danger of aspiration of mucous.
    - b. Counteracts the depressant effects of morphine upon respirations.

d. Morning of operation:

- (1) TPR
  - (a) Taken and recorded on nurse's notes.
  - (b) Purpose - to detect signs of upper respiratory infection.
  - (c) Elevation - report to nurse.
- (2) Valuables - taken from patient, labeled, and locked on ward.
- (3) False teeth:
  - (a) Cared for with valuables.
  - (b) Avoid breaking.
- (4) Bladder - empty just before leaving ward.
  - (a) Prevent patient voiding on operation table.
  - (b) Prevent puncture of distended bladder.
- (5) Hypodermic:
  - (a) As ordered by doctor.
  - (b) Usually given by nurse.
- (6) Chart - accompanies patient to operating room.
- (7) Wheeled litter - sent from operating room.

2. Preparation to receive patient: Prepare bed as taught in Period #19.

3. Postoperative care:

- a. Receiving patient from operating room:

- (1) Returned to ward by anesthetist and technician.
- (2) Sufficient help in lifting patient into bed.
- (3) Cover patient immediately.
- (4) Position:
  - (a) Varies with operations and anesthetic.
  - (b) Keep air passage open.
- (5) Discuss orders and patient's condition with anesthetist.

b. Immediate postoperative care:

- (1) Special patient - do not leave alone until conscious.
  - (a) Note changes immediately.
  - (b) Avoid blocked airways.
- (2) TPR
  - (a) Take pulse and respirations every ten (10) minutes.
    - 1. Note rate and rhythm.
    - 2. Any change - notify nurse.
  - (b) Take temperature when conscious.
- (3) Blood pressure:
  - (a) Take as ordered by doctor - depends upon condition of patient and anesthetic.
  - (b) Any change - notify nurse.
- (4) Color and condition of skin:
  - (a) Normal - face flushed, skin moist and warm.
  - (b) Cyanosis - indicates lack of oxygen.
  - (c) Increasing pallor - may be sign of hemorrhage.
  - (d) Cold and clammy - signs of shock.
- (5) Dressing - note frequently for presence or absence of drainage of blood.
  - (a) May be reinforced but not changed.
  - (b) Amount of blood or drainage increase - notify nurse.

c. Later postoperative care:

(1) Discomfort:

- (a) Due to operation and anesthetic, mental strain.
- (b) Notify nurse - she will give morphine or other medication as ordered by doctor.

(2) Nausea and vomiting - usually follows general anesthetic:

- (a) Record amount and character.
- (b) Avoid choking.
- (c) Keep patient clean.
- (d) If continues, notify nurse.

(3) Loss of fluids:

- (a) Dehydration due to loss of blood, sweating, and vomiting, and limited intake by mouth.
- (b) Fluids may be restored by intravenous therapy as ordered by doctor.

(4) Diet - varies according to operation; ordered by doctor.

(5) Distention - "Gas Pains"

- (a) Due to accumulation of gas in the intestines. Abdomen swollen and hard. Usually appears about 48 hours after operation.
- (b) Caused by:
  - 1. Swallowed air.
  - 2. Relaxation of intestines during operation.
- (c) To avoid: turn frequently.
- (d) To treat:
  - 1. Enema; rectal tubes as ordered by doctor.
  - 2. Medications as ordered by doctor.

(6) Voiding:

- (a) Postoperative retention common:
  - 1. Nervousness.
  - 2. General anesthetic diminishes sensitivity.
  - 3. Partial paralysis of muscles of bladder.
- (b) Note amount and time of first voiding.

(7) Care of wounds - Technician does not change dressing unless instructed to do so.

- (a) Clean wound - dressing usually not done until doctor removes sutures on about the seventh day.
- (b) Draining wounds:

- 1. Dressing reinforced as needed.
  - 2. Changed as ordered.

d. Postoperative complications:

(1) Shock:

(a) Preventive measures:

- 1. Avoid anxiety
  - 2. Avoid dehydration
  - 3. Avoid loss of rest preoperatively

(b) Symptoms:

- 1. Soft, rapid, running pulse
  - 2. Irregular respirations
  - 3. Cold clammy skin
  - 4. Subnormal temperature

(2) Hemorrhage:

(a) Types:

- 1. Primary - occurs first 24 hours after operation.
  - 2. Secondary - occurs from 24 hours after operation till wound is completely healed.

(b) Symptoms:

1. Internal:

- a. Rapid thready pulse
  - b. Subnormal temperature
  - c. Pallor
  - d. Restless and apprehensive
  - e. Thirst and air hunger

2. External:

- a. Increase pulse rate
  - b. Increase of blood on dressing

(3) Pneumonia - preventive measures:

- (a) Avoid drafts
- (b) Prevent aspiration of mucous and vomitus
- (c) Turn frequently

(4) Other complications:

- (a) Infection - usually manifested on third or fourth day; rise in temperature.
- (b) Peritonitis - acute inflammation of peritoneum. Treated by doctor with sulfa and penicillin.

Training Notes:

1. Set up unit and make bed for demonstration in advance. Use student as patient for demonstration.
2. Demonstrate each step as it is explained.
3. Emphasize that the technician will care for preoperative and postoperative patient as directed by nurse.
4. Stress reporting any change or question about patient's condition to the nurse.

Twenty-eighth Period - One Hour  
Nursing Care of Burns

Place: Classroom

References: Adm. Memo #33, Office of Chief Surgeon ETO, dated 16 March 1944; "Principles and Practice of Nursing," Harmer and Henderson, Ch 44

Instructional Aids:

Personnel: One officer to act as lecturer

Equipment: Blackboard

Individual Equipment: Notebook and pencil

51st Hour - Lecture

Points to be Covered:

1. Introduction

a. Review of types of burns

(1) 1st degree - reddening of the skin

- (2) 2d degree - blistering of the skin
- (3) 3d degree - charring and destruction of tissue

b. Responsibility in caring for burned patients:

- (1) Present problem of exacting technique, constant observation, and sympathetic understanding.
- (2) Patient's life and future may depend upon the care which he receives.

2. Explanation

a. Care on admission:

(1) Problems:

- (a) Relieve pain - morphine as ordered
- (b) Prevent shock
- (c) Prevent infection - strict aseptic technique

(2) Emergency treatment:

- (a) Emergency blood work and urinalysis
- (b) Blood plasma - restore fluid lost through burned area
- (c) Large doses of morphine - relieve pain and apprehension
- (d) Wound:

1. Treatment

- a. May or may not be debrided - extent depends upon degree, contamination, and length of time since burn was incurred.  
(Immediately after a patient is burned, areas injured are relatively sterile due to heat involved.)
- b. Pressure dressings.

2. Precautions - strict aseptic technique:

- a. Doctor scrubs as for surgery.
- b. Patient's clothing removed immediately.
- c. Patient placed in sterile field.
- d. All personnel including patient wear masks.

b. Care on ward:

(1) Dietary care:

## (a) Diet

1. High protein - extensive loss of serum proteins through burned area.
2. Intake sufficient to avoid vitamin deficiency.

## (b) Feeding

1. Feed if necessary
2. Vary diet
3. Frequent small feedings

- (2) Fluids - forced to replace fluid lost from burned area.
- (3) Treatment (varies greatly):

## (a) Doctor's responsibility - to order treatment:

## 1. Chemotherapy

- a. Sulfa drugs
- b. Fenicillin
- c. Streptomycin

## 2. Dressings

- a. Type - usually pressure dressings changed every 10 to 14 days, or as directed by doctor.
- b. Precautions (strict aseptic technique): Scrub before changing dressing; all personnel masked; ward free from dust.

## 3. Saline tubs

- a. Used to complete debridement.
- b. Precautions: Strict aseptic technique.

## (b) Nurses' and technicians' responsibility:

1. Carry out doctor's orders.
2. Prepare treatment.
3. Maintain supplies for treatments.

## (4) Daily observation and bedside care:

- (a) Observation of poor circulation due to pressure dressings.
- (b) Rise in temperature - may be indication of infection.
- (c) Complaints of pain.

- (d) Prevent pressure sores.
- (e) Mental attitude of patient - concern for his condition and self-pity.

c. Later care:

- (1) Physiotherapy: Exercise to prevent contractures.
- (2) Skin grafting: To correct contractures and deformities.

Training Notes:

1. Stress importance of aseptic technique in caring for burned patients.

2. Emphasize that the treatment is the doctor's responsibility; the technician's responsibility is to carry out the doctor's orders.

Twenty-ninth Period - Two Hours  
Nursing Care of Mental Patients

Place: Classroom

References: None

Instructional Aids:

Personnel: Projectionist

Equipment: TF 8-2090; TF 8-1428; projector and screen

Individual Equipment: None

52nd and 53rd Hours - Films

Points to be Covered:

1. Show TF 8-1428.

a. Deals with the ward of the Hospital Corpsman in the ward care of neuropsychiatric patients. Many types of mental illnesses are shown and methods of treating each case is demonstrated. The corpsman can hasten recovery of patient by kind and understanding care.

2. Show TF 8-2090.

a. Demonstrates procedure of Medical Corpsman in the administration of various types of therapy to psychotic patients. The details of the "Continuous Tub" and Cold Wet Pack treatments are shown. Described also are Medical Corpsman's duties and precautions to be taken on locked wards in connection with the patients' shower, shaving, smoking, etc. A final sequence discusses suicide prevention in psychotic ward.

Thirtieth Period - One Hour  
Medical Technician and the Nervous Patient

Place: Classroom

References: "Principles of Psychiatric Nursing," Ingram; "Emotional Hygiene," Anderson

Instructional Aids:

Personnel: One officer to act as lecturer

Equipment: Blackboard

Individual Equipment: Notebook and pencil

54th Hour - Lecture

Points to be Covered:

1. Introduction

a. Definition of psychosis: Prolonged abnormal behavior in one who has heretofore been demonstrating normal and socially acceptable behavior. Does not include temporary states of abnormality: deliria. Two main groups: Organic and Functional.

b. Prevalence: Hundreds of thousands of people in our country are mentally ill or emotionally ill. One in every ten definite deviation. One in every twenty hospitalized at one time or another. Mental illnesses on the increase.

c. Past treatment: Earliest known time--persecution. This was followed by an era in which segregation was practiced. Later humanitarianism entered into the treatment. Today our attitude is scientific, but the old prejudices still linger on. The attitude toward mental patients is very important. It can speed or retard the recovery of the patient. The technician should have an attitude of patience, tolerance, and understanding. Mental patients are not stupid, they are ill.

2. Explanation

a. Approach to special situations:

(1) Excited type of patient (manic):

(a) Object: Reduction of stimuli. Keep your voice low and calm; avoid long conversations or arguments. Avoid forcing issues; bolster up his self-

respect by indirect but honest compliments.  
Eliminate competition, noise.

(2) Retarded type (depressed):

(a) Encourage the person to talk, and to ask for advice. Do not display irritability even when he is slow to understand. Keep voice fresh and interesting. Monotones are no relief to the patient's already dull life.

(3) Preoccupied type (schizo):

(a) Will not give you his attention, probably will not respond. If he does, it will probably be with irritation because you have disturbed his day-dreaming which he finds pleasurable. Do not order him or force him. Try to suggest things. Example: To brush his teeth, just hand him a toothbrush.

(4) Hypochondriacal type (psychoneurotic):

(a) Avoid topics which give him an opportunity to dwell on his physical condition. If you have to ask, make it a specific question. Do not show disbelief in his "illness;" it will cause him to lose faith in you. Converse, agree with his complaints; these will strengthen his belief in being sick. Keep neutral.

(5) Elderly type (senility):

(a) Varies from case to case, but do not call them "grandpa," "granny," etc.

(6) Violent patient:

(a) Try not to deal with him alone; have several technicians to help you. Presence of several men will lessen his aggressiveness, also lessen chance of injury to either party. Use force only when necessary, and then kindly. Use of restraint: only as a last resort. Never as a punishment.

b. Specific rules to be followed with neuropsychiatric patients:

(1) Be constantly aware of the sources of danger to the patient, personnel, and property. All depressed patients are potential suicidals.

(2) Patients are never left alone in the bathroom or tub.

- (3) Supervise patients at all times.
- (4) Packages to be searched.
- (5) Patients not allowed to sign checks or any other documents without the permission of the ward officer.
- (6) Avoid discussing one patient before another.
- (7) Facts concerning the life and symptoms of the patient are for discussion within hospital walls only.
- (8) Do not laugh at patient's symptoms or behavior.
- (9) Use physical force kindly, but only as a last resort.
- (10) Do not give information about any patient to anyone not connected with the ward or hospital; not even to relatives.
- (11) Do not buy things for the patient, give gifts to the patients, or accept gifts from the patient, without specific permission from the ward officer.
- (12) Never sleep on duty when with neuropsychiatric patient.
- (13) Suicidal patients listed as special watch. Keep at arms length.
- (14) Never lie to a patient. Never kid him or ridicule his strange behavior.
- (15) Do not mail a letter from a neuropsychiatric patient without permission from the officer in charge. Same goes for phone calls.
- (16) No financial dealings of any kind with the patient without specific authorization.
- (17) When detailed to accompany neuropsychiatric patient any place you are responsible for his safe return and are in complete charge.
- (18) Make no promises you may not be able to fulfill; disappointment may prove too much to a neurotic patient.
- (19) When administering medications, make sure the patient takes it. There is only one way to make sure, see that he does.
- (20) Not all patients on a neuropsychiatric ward are mental patients; some are there for observation or some other reason. Make their stay pleasant.

Training Notes:

1. Stress importance of an understanding attitude on the part of the technician.
2. Stress avoiding use of force.

Thirty-first Period - Two Hours  
Care of the Ward

Place: Classroom

References: TM 8-220, Ch 4, Sec I; "Principles and Practice of Nursing," Harmer and Henderson, Ch 5

Instructional Aids:

Personnel: One man to direct conference and demonstration; three (3) men per 18-bed ward to supervise applicatory work

Equipment: 1 model ward, complete

Individual Equipment: Notebook and pencil

55th and 56th Hours - Conference, Demonstration, Application

Points to be Covered:

1. Importance of cleanliness and standardization.

- a. Better environment for patient.
- b. Save time for personnel.
- c. Better utilization of supplies.
- d. Prolong life of equipment.

2. Cleaning the ward proper.

- a. Remove to proper place all extra furniture and equipment.
- b. Patient Unit - ambulatory patients care for own units. Ward personnel care for units of bed patients, empty units, and see that ambulatory patients properly care for their units.

- (1) Dust bed and springs.
- (2) Change mattress cover after discharge of patient and as needed.
- (3) Make bed.
- (4) Clean bedside table of unnecessary equipment. Dust and arrange equipment in proper order.
- (5) Arrange unit in proper order.

c. Dusting

- (1) Use damp rags; never use soiled towels or other linen.
- (2) Dust everything daily: beds, bedsprings, chairs, bedside table in patients' units; radiators, electric light fixtures, woodwork, doors, bulletin boards, etc. (Pay particular attention to corners, back of radiators, rafters, etc.)

- d. Empty all waste baskets daily and as needed.

e. Floor - cleaning depends upon composition.

(1) Sweeping, mopping, or waxing:

(a) Move all furniture.

(b) Do half of ward at a time - avoid tracking.

(c) Avoid dust.

(2) Linoleum or hardwood - kept polished.

(3) Unfinished wood floors - mopped daily with warm soapy water. Change water frequently. Clean and dry mop in sun after use.

f. Copper, brass, or nickle light fixtures - polish with metal polish.

g. Porcelain sinks - warm soapy water and muscular effort.

3. Arranging patients' units in ward - demonstrate.

a. All furniture in line on each side of ward.

b. Beds opposite each other on both sides of ward.

4. Utility room - cleaning of (demonstrate).

a. Remove all extra equipment - return to Central Service, etc.

b. Shelves washed - no shelf paper.

c. All enamelware cleaned with soap, sand soap and warm water, dried and stacked in neat order on shelves.

d. Enema equipment, rectal tubes, etc. - clean and dry, rubber tubing never bent.

e. Bed pan rack - washed bed pans and urinals cleaned and dried, stains removed with chlorine solution.

f. Hopper and sink - cleaned with scouring powder; faucets with metal polish. Clean pipes and drains. Water stains can be removed with chlorine solution.

g. Utensil sterilizer - clean inside and outside. Use stiff brush on inside. If chromium finish, use metal polish on outside.

5. Care of cleaning equipment.

a. Mops and brooms - clean carefully and when not in use keep on rack provided for purpose, usually outside.

b. Scrub buckets - keep clean and free of deposits.

6. Summary - Ward should be in state of cleanliness at all times so that regardless of the time anyone may appear, it will be ready for inspection.

7. Students clean ward and prepare for inspection.

Training Notes:

1. Stress importance of cleanliness and standardization.
2. Demonstrate each step as it is explained.
3. Supervise students closely; stress thoroughness.

Thirty-second Period - One Hour  
Elimination of Body Wastes

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, Ch 14

Instructional Aids:

Personnel: One man as demonstrator

Equipment: 1 glass graduated urinal  
1 1000 cc glass graduate  
1 petri dish  
1 glass specimen bottle  
2 glass slides

Sample copies: WD AGO Forms 8-67, 8-69, 8-71, 8-68, and 8-70

1 enamel urinal  
1 enamel pitcher, large  
4 sputum boxes  
1 test tube with applicator

Individual Equipment: Notebook and pencil

57th Hour - Conference, Demonstration

Points to be Covered:

1. Introduction

a. In many cases accurate intake and output record, and the report of the analysis of specimens assist the doctor in:

- (1) Making diagnosis.
- (2) Determining progress of the disease.
- (3) Obtaining information regarding results of treatment employed.

b. On the ward it is usually the technician's responsibility to keep the bedside intake and output record and to collect most specimens.

## 2. Explanation

a. Under normal conditions the body tends to maintain a balance between the fluid intake and output.

### (1) Intake of fluid in the body.

- (a) Food
- (b) Fluids
- (c) Combustion of food within the body

### (2) Output of fluid from the body

- (a) Urine
- (b) Feces
- (c) Perspiration
- (d) Exhaled air

b. In disease the body sometimes fails to maintain fluid balance. To study the fluid balance and the function of certain organs doctors sometimes order a record of intake and output to be kept.

- (1) Intake includes all liquids taken by mouth or I.V. Do not attempt to measure fluid in food.
- (2) Output includes all urine and vomitus. Do not attempt to estimate perspiration and fluid lost in feces.
- (3) Kept at patient's bedside. Record kept by patient or person caring for patient.
- (4) Intake and output totaled at 2400 hours. Totals recorded on nurses' notes.

c. Specimens: Anything taken from the body for examination. It may be tissue as blood, muscle, etc., or waste of tissue as urine, feces, etc.

### (1) Responsibility of technician in collecting specimens:

- (a) Prepare patient
- (b) Assemble the equipment
- (c) Collect or assist in collection of specimen
- (d) Take specimen to lab
- (e) Clean up equipment and replace

### (2) Most common specimens:

- (a) Sputum: Material coughed up from "deep down," in the lungs. Usually collected in the morning.

Collect in petri dish or sputum box. Amount needed - about one (1) teaspoonful.

(b) Urine

1. Routine specimen: Collected morning after admission. Amount needed - at least 30 cc. Collect in clean urine bottle.
2. Sterile specimen: Clean patient well with tincture of green soap. Specimen voided directly into sterile bottle. Send to lab immediately. It is sometimes necessary to collect by catheterization.
3. 24 hour specimen: All urine voided over 24 hour period; collect in large clean bottle.
4. Special tests: As ordered by the doctor.

(c) Stool or feces - collect in clean bed pan. A small mass of feces is picked up on a tongue blade from the bed pan and deposited in glass jar or cardboard box. Take to laboratory immediately.

(d) Vomitus - transfer from basin or pan in which it was collected into a glass jar and send to laboratory immediately.

(e) Blood - usually drawn from vein by means of sterile needle, transferred to test tube, and sent to laboratory immediately. Blood specimens are usually drawn by the laboratory technician.

(f) Others - fluid from body cavities, smears from wounds - usually collected by doctor.

(3) Rules to observe in collecting specimens:

- (a) Collect specimens in clean containers.
- (b) Label accurately.
- (c) Collect in proper container.
- (d) Collect sufficient quantity.
- (e) Take precautions not to contaminate outside of container.
- (f) Take to laboratory as soon as possible.
- (g) Two laboratory slips must accompany every specimen:

1. All information requested at top must be filled in on both slips.
2. All tests desired must be checked on both slips.

(h) Clean up equipment after collecting specimen.

(i) Never leave specimens at bedside of patient or in patient's bathroom. Label and take to utility room until they can be taken to the laboratory.

3. Demonstration

a. Demonstrate the method of measuring urine:

(1) Enamel urinal and graduate.  
 (2) Glass graduated urinal.

b. Demonstrate different types of containers used for collection of specimens, methods of labeling, and W.D. AGO 8-series, form to accompany each specimen.

Training Notes:

1. Stress correct labeling of specimens.
2. Stress taking specimens to laboratory immediately or as soon as possible.
3. Stress being accurate in measuring intake and output - not guessing.

Thirty-third Period - One Hour  
Medications; General Rules in Giving Medications

Place: Classroom

References: "Essentials of Nursing," Young, Ch 10; TM 8-220, par 212

Instructional Aids:

Personnel: One person to act as lecturer

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

58th Hour - Lecture

Points to be Covered:

1. Purpose of giving medications:
  - a. Preventative - to prevent development of a disease.
  - b. Curative - to cure disease.
  - c. Relief of pain and discomfort.

2. Responsibilities of person giving medicines:

- a. To carry out doctor's orders promptly.
- b. To be meticulously accurate.
- c. To administer medication in the manner that will produce the best results.
- d. To know average dose and question unusual order before administration.
- e. To observe and report accurately the action of the drug administered.
- f. To be on alert and report immediately all warning signs of overdosage and idiosyncrasy (unusual action).
- g. To understand factors of the drug that determine method and time of administration; e.g., the nature of the drug, the desired effect, the taste.

3. General rules concerning care, measuring, and administration of medicines:

- a. Keep medicine cabinet locked and do not leave key where patient can get it. (Nurse carries key on her person.)
- b. Never keep medicines in unmarked bottles, and do not use medicine left in an unmarked glass.
- c. Any change in color, odor, or consistency should be reported to nurse or ward officer before use.
- d. Give medicine on time.
- e. While measuring medicine, never think of anything but the work on hand and never speak to anyone or allow anyone to speak to you.
- f. Measure exactly; never give a patient a drop more or less than the amount ordered.
- g. While pouring a medicine, hold the glass with the mark of the quantity you require on a level with your eye; if the mark is above your eye, you will give too little, if below, too much.
- h. Read the label on the bottle three times: before taking it from the shelf, before pouring out the medicine, and after pouring out the medicine.
- i. Shake bottle of liquids before pouring.

- j. Pour on side opposite label on bottle to avoid soiling label
- : k. Replace cork or top immediately after pouring medicine from bottle. Some medicines evaporate or change consistency if left open.
- l. Never mix medicines which precipitate or change color when mixed.
- m. Do not dilute syrup cough medicines - soothing effect will be less if diluted.
- n. Make doses of medicine as palatable as possible. If indicated, dilute or follow with water, orange juice, etc.
- o. Never give anything by mouth to an unconscious patient. Medical officer should be present to give medicines to a delirious patient.
- p. Never allow one patient to carry medicine to another.
- q. Be certain you have the right medicine for the right patient.
- r. Do not leave a patient until the medicine is swallowed.
- s. Never record a medicine as given until the patient has taken it.

Training Notes:

1. Stress responsibilities of person giving medicines.
2. Emphasize carrying out orders accurately.

Thirty-fourth Period - Two Hours  
Bed Making Review

Place: Classroom

References: "Principles and Practice of Nursing," Harmer and Henderson, Ch 5, 12, and 41

Instructional Aids:

Personnel: One man per eight (8) students to supervise applicatory work

Equipment: None

Individual Equipment: 1 pair of pajamas per student;  
1 set per every two (2) students:  
1 patient unit                    1 blanket  
5 sheets                        2 pillow cases  
1 rubber draw sheet            1 small rubber square

59th and 60th Hours - Application

Points to be Covered:

1. Review of unoccupied bed as taught in Period #4.
2. Review of occupied bed as taught in Period #6.
3. Review of postoperative bed as taught in Period #19.

Training Notes:

1. 50% of students act as patients; 50% as technicians.
2. Correct mistakes and breaks in procedures as they are made.
3. Stress:
  - a. Only one student makes a bed at a time.
  - b. Students work from side of bed; never from head or foot.
  - c. Miter corners carefully; pull bottom sheet tight.
  - d. Never place soiled linen on floor.
  - e. Rearrange unit and take out soiled linen when finished.

HISTORY OF THE MEDICAL DEPARTMENT

(16)

PERIOD	HOURS	WEEK	SUBJECT
1	1	1	Medical Department From 1775 to Present
1	1		TOTAL

1. Purpose and Scope: To give the student an understanding of the evolution of the Medical Department, its place in military and medical history, and its pride in its achievements and standards.

2. Standard of Proficiency: A highly developed "esprit de corps" as a result of a knowledge of the background and achievements of the Medical Department, its colors, traditions, and insignia.

3. References: Military Medical Manual; "History of the Medical Department," Ashburn; current files of "The Bulletin of the U.S. Army Medical Department."

First Period - One Hour  
Medical Department From 1775 to Present

Place: Classroom

References: "History of the Medical Department," Ashburn; MEM, pages 331-373

Instructional Aids:

Personnel: Instructor

Equipment: Flash cards (Insignia); blackboard and chalk

Individual Equipment: Notebook and pencil

1st Hour - Conference

Points to be Covered

1. Introduction

a. Sketch briefly the Medical Service in ancient history, and the recognition of its importance by ancient and medieval military leaders.

b. Impress the meaning of the motto "To Conserve the Fighting Strength."

2. Conference

a. Re-emphasize and discuss the mission of the Medical Department.

b. Give a brief sketch of the organization of the Medical Department.

(1) Administrative Organization:

- (a) The Surgeon General
- (b) The various corps which compose the Medical Department: MC, DC, PC, MAC, VC, ANC, SnC, PhTh, HD, Contract Surgeon.

(2) Tactical and Service Organization:

- (a) Units of the combat zone.
- (b) Units of the communications zone.
- (c) Units of the Zone of the Interior.

c. Point out how vital the service of the Medical Department is to the Army, and how commanders have recognized this importance by a discussion of:

- (1) Its role in the war for independence.
- (2) The War of 1812.
- (3) The organization of the modern Medical Department under the first Surgeon General (Gen Lovell) during the period 1818-1836.
- (4) Utilization of the Medical Department during the Mexican War.
- (5) During the War between the States, emphasizing the birth of modern evacuation methods and medical service in the field.
- (6) The growth and change during and throughout the Spanish-American War, including the birth of the ANC and the foundation of the Army Medical School.
- (7) The contributions of the Army Medical Department to the combat of insect-borne diseases, and to the uses of vaccines.

d. Status of the Medical Department at the beginning of World War I:

- (1) Organization
- (2) Transportation of units
- (3) Methods of training
- (4) Special problems of static warfare, and the Medical Department's methods of transportation and evacuation of sick and wounded.

(5) Summarize Medical Service during World War I, emphasizing huge casualty lists, great increase in hospital facilities, heavy casualties in the Medical Department itself. (First officer and enlisted man killed were of the Medical Department.)

e. Professional advancement of the Medical Department after World War I.

- (1) List Surgeon Generals
- (2) Organization of Reserve Units
- (3) Drastic reorganization of tactical units and the employment thereof.
- (4) Foresight in preparing for medical service to fast-moving combat tactics, with advances in evacuation and clearing methods.

f. Status of the Medical Department at the beginning of World War II.

- (1) The Regular establishment.
- (2) The Reserve establishment, including ORC and National Guard.

g. Medical Service during World War II:

- (1) Types of tactical units, including Combat Zone, Communications Zone, and Zone of the Interior.
- (2) Research, development, and use of Sulfa, Penicillin, Atabrine, etc.

h. The future of the Medical Department:

- (i) Opportunities for educational and professional advancement, both in the service and after separation.

Conclusion:

1. Summarize main points.
2. Promote discussion by pertinent questions; encourage questions from students.



PERIOD	HOURS	WEEK	SUBJECT	
1	1	1	Echelonnement of Evacuation; Organization of Medical Department Units; Combat Evacuation. (Conference)	
2	1	1	Selection of Sites for Tactical Medical Department Installations; Relationship of Tactical Installations to Evacuation Facilities from Battlefield to Zone of the Interior.	
2	2		TOTAL	

1. Purpose and Scope: To present the organization of the various units in the chain of evacuation from the battlefield through the combat echelons to the Zone of the Interior, and to place these units in their proper relationship and positions in the chain.

2. Standard of Proficiency: Each student must be able to:

a. Visualize the chain of evacuation in terms of the various units.

b. Understand the relationship of each link in the chain to supporting units and to each other.

c. Understand the general scope of technical procedures performed by each link in the chain of evacuation.

d. Know the general responsibilities of each link in the chain of evacuation from the battlefield to the Zone of the Interior in fulfilling their respective portions of the mission of the Medical Department.

e. Gain a realization of the hazards and obstacles of battlefield treatment and evacuation.

First Period - One Hour

Echelonnement of Evacuation; Organization of Medical Department Tactical Units; Combat Evacuation

Place: Classroom

References: FM 7-30, Ch 7; FM 8-5, Ch 2 and 4; FM 8-10, Ch 2.

Instructional Aids:

Personnel: None

Equipment: Blackboard and chalk

Individual Equipment: Notebook and pencil

1st Hour - Conference

Points to be Covered

1. Introduction:

a. Outline the chain of evacuation, through its various echelons, from the Company Aid man to the Zone of the Interior.

2. Conference:

a. Organization of Medical Department Tactical Units:

(1) Medical Detachment with Combat Unit (Inf Rgt, Arty Bn, Engr Bn, etc.)

- (a) Station Section
- (b) Litter Sections
- (c) Company Aid Men

(2) Collecting Company

- (a) Ambulance Platoon
- (b) Litter Platoon
- (c) Station Platoon

(3) Clearing Company

(a) Clearing Platoons (2), with brief discussion of reasons for two (2) such platoons.

b. Brief exposition of hospital facilities in support of Tactical Units.

- (1) Field Hospital
- (2) Evacuation Hospital
- (3) Surgical Hospital
- (4) Numbered General Hospital
- (5) Convalescent Hospital

c. Outline evacuation chain through the various installations operated by the units listed above.

(1) Show methods of evacuation, processing from hand carries through litter carriers, ambulances, other vehicles, ships, trains, aircraft.

d. Explain the flexibility of all Medical Department units to allow alteration to fit abnormal situations. Explain that the unusual situation is the rule, rather than the exception; that the following is required:

- (1) Constant improvisation to meet changing situations and circumstances.
- (2) Use of natural and native advantages.

Conclusion:

1. Review points covered. Encourage discussion and questions. Prepare questions to promote discussion.

Second Period - One Hour

Selection of Sites for Medical Department Tactical Installations;

Relationship of Tactical Installations to Evacuation Plan;

Operation of Evacuation Facilities from Battlefield to Zone of the Interior.

Place: Demonstration Area

References: All Previous References

Instructional Aids:

Personnel: 2 Enlisted assistants to aid with demonstration terrain.

Equipment: Demonstration terrain features including (buildings, bridges, and vehicles).

Individual Equipment: None

2d Hour - Conference and Demonstration

Points to be Covered

1. Introduction:

a. Review the chain of evacuation, organization of Medical Department Units, and combat evacuation problems as outlined in first period.

2. Conference and Demonstration:

li

- a. Describe the Battalion Aid Station and its setup.
  - (1) Explain the features necessary for siting the Battalion Aid Station. Discuss advantages and disadvantages of various sites on demonstration terrain, and finally place the installation. Discuss Aid men and litter-bearers and their responsibilities as initial units of the evacuation chain. Picture a casualty starting toward the rear.
- b. Describe the Collecting Station and its setup.
  - (1) Discuss siting in relation to Battalion Aid Stations, lines of drift there from, and vehicular routes to facilitate evacuation of the Aid Stations. Site Collecting Station and bring imaginary casualty to that point.
- c. Describe the Clearing Station and its setup.
  - (1) Discuss siting in relation to Collecting Stations, vehicular and walking routes from them, emphasizing the fact that the Clearing Station serves an entire division, with 12 to 16 or more Aid Stations funneling their loads into the one Clearing Station. Site the Clearing Station and bring the imaginary patient to that point. Remind students that this is where Emergency Treatment ends and definitive, more elaborate treatment begins. Establish fact that often there is a mobile Hospital installation in the vicinity where chest and abdominal emergencies may be operated on.
- d. Site Field, Evacuation, Convalescent, and numbered General Hospitals in relation to Clearing Station and to routes of evacuation. Point out fact that many casualties are treated and returned to their organizations from one of those installations. Move imaginary patient to one or more of those.
- e. Bring imaginary patient to the Zone of the Interior. Re-emphasize the mission of the Medical Department, "To Conserve the Fighting Strength," and remind the students that the entire chain of evacuation and treatment is established for the furtherance of this mission.
- f. Summarize points covered. Re-emphasize main points. Ask for questions. Promote discussion.





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MASTER SCHEDULE

MEDICAL AND SURGICAL TECHNICIAN COURSE

SUBJECT	Total Hours	Hours per week							
		1	2	3	4	5	6	7	8
<b>Technical Subjects</b>									
1. Anatomy and Physiology	30	6	9	6	7	2			
2. Commandant's Orientation	1	1							
3. Commandant's Time	13		1	2	2	2	2	2	2
4. Emergency Medical Treatment	29		2	4	2	3	8	2	8
5. Examinations	9		2	1	1	1	1	1	2
6. General Training in Hospital Procedures	50	2	5		4	3	4	17	10
7. Hygiene and Prevention of Disease	30	4	3	7	3	4	4	1	4
8. Materia Medica	15					3	7	3	2
9. Mathematics	8		2	1	3	2			
11. Physical Training	40	5	5	5	5	5	5	5	5
12. Public Property	5						2	3	
13. Troop Information	8	1	1	1	1	1	1	1	1
14. Ward Management	8	2	1	1	1			1	2
15. Ward Procedures	58	4	8	12	11	9	6	4	4
16. Indoctrination Subjects									
Class Organization		4	4						
Emergency Medical Treatment		3	3						
Employment of Medical Depart- ment Units		2	2						
History of Medical Department Units		1	1						
Medical Equipment		1	1						
Medical Records		2	2						
Organization and Function of Medical Department Units		2	2						
Morale and Character Building		1		1					
<b>TOTAL</b>	<b>320</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>	<b>40</b>



COMMANDANT'S TIME

(3)

1. Purpose: The thirteen (13) hours allocated as Commandant's Time within the course are intended to provide time for additional instruction in prescribed subjects and to compensate for unavoidable interruptions in the course.

2. Training Notes:

a. Training time lost due to unavoidable interruptions will be made up promptly by use of the time allocated to the Commandant and the minimum amount of off-duty time as may be required to complete the course in the prescribed period.

b. Individuals who are found deficient generally or in specific subjects will be given additional instruction in off-duty hours so that the prescribed training may be completed within the training period.

c. Training officers will show Commandant's Time on the Weekly Training Schedule and will indicate in parentheses immediately thereafter the subjects to be scheduled.



## EXAMINATIONS

(5)

1. Purpose and Scope: To conduct written tests and applicatory examinations in all subjects for the purpose of determining the training needs, evaluation of student's progress, and the final results of the training program.

2. Basic References: FM 21-5.

3. Training Notes:

a. The nine (9) hours allocated to "Examinations" are for appropriate use by the various courses concerned. During these hours written examinations will be conducted to determine the current status of proficiency in training.

b. Within forty-eight (48) hours after completion of each examination an alphabetical roster of grades attained by each student will be forwarded to the Academic Records Branch through normal administrative channels.

c. Officers and cadremen will be present with students during "Examinations" for assistance and maintenance of order.

d. It is expected and desired that additional examinations be given utilizing "Commandant's Time" throughout the training program.



INDOCTRINATION SUBJECTS

(16)

PERIOD	HOURS	WEEK	SUBJECT
1-4	4	1	Class Organization
1-3	3	1	Emergency Medical Treatment
(1)	(1)	(1)	Wounds (Types and General Treatment), Hemorrhage, Pressure Points, Digital Pressure, and Tourniquet Points
(2)	(1)	(1)	Bandages (Roller and Triangular)
(3)	(1)	(1)	Fractures (Types, Symptoms, Complications, and Treatment), Burns (Causes, Types, Complications and Treatment), Heat Exhaustion, Sunstroke, and Heat Cramps, Unconsciousness, Fits, Epilepsy, Apoplexy, Head Injuries, and Abdominal Pains.
1-2	2	1	Employment of Medical Department Units
(1)	(1)	(1)	Echelonment of Evacuation; Organization of Medical Department Units; Combat Evacuation. (Conference)
(2)	(1)	(1)	Selection of Sites for Tactical Medical Department Installations; Relationship of Tactical Installations to Evacuation Facilities from Battlefield to Zone of the Interior.
1-2	1	1	History of the Medical Department
(1)	(30 min)	(1)	Medical Department From 1775 to World War I.
(2)	(30 min)	(1)	Medical Department From the Beginning of World War I to date.
1	1	1	Medical Equipment: Medical & Dental Kits- Private's and the Officer's and Noncommissioned Officer's; Standard Medical Department Chests (Conference and Demonstration)
1-2	2	1	Medical Records
(1)	(1)	(1)	Emergency Medical Tag and Field Medical Records (Conference)

PERIOD	HOURS	WEEK	SUBJECT
(2)	(1)	(1)	Field Medical Card & Field Medical Record Jacket (Conference, Demonstration, and Application)
1-2	2	1	Organization and Function of Medical Depart- ment Units
(1)	(1)	(1)	Steps of Evacuation; First and Second Eche- lons of Medical Service; The Clearing Station.
(2)	(1)	(1)	Second, Third, Fourth, and Fifth Echelons of Medical Service.
1	1	2	Morale and Charactor Building
16			TOTAL

### CLASS ORGANIZATION

1. Purpose: Five (5) hours are allotted to Class Organization to provide time for administrative, supply, and organization or unit functions not directly pertinent to the technical training involved in the course, thus eliminating, to the maximum possible extent, interruptions and resultant lost time on the part of the students and lost effort on the part of the instructors.

2. Administrative Notes:

a. Commandant's Orientation: \*Lesson Plan (2), this manual.

b. Personnel Processing: Students will be available, individually, during the periods allotted to Class Organization, for processing procedures which responsible agencies have been unable to complete prior to the opening of the course.

c. Company and Battalion Processing: Necessary barracks, platoon, and company organization and orientation will be accomplished during this period. Battalion and Staff orientations may be scheduled, using representatives of the various Staff sections to acquaint the students with functions related to them.

d. It is not expected or desired that these hours will be used for individual or collective passes, but will be utilized in bona fide preparation for the uninterrupted technical training to follow.

\* Included in the five (5) hours allotted to Class Organization.



EMERGENCY MEDICAL TREATMENT

PERIOD	HOURS	WEEK	SUBJECT
1	1	1	Wounds (Types and General Treatment), Hemorrhage, Pressure Points, Digital Pressure, and Tourniquet Points
2	1	1	Bandages (Roller and Triangular)
3	1	1	Fractures (Types, Symptoms, Complications, and Treatment), Burns (Causes, Types, Complications and Treatment), Heat Exhaustion, Sunstroke, and Heat Cramps, Unconsciousness, Fits, Epilepsy, Apoplexy, Head Injuries, and Abdominal Pains.
3			<b>TOTAL</b>

1. Purpose and Scope: To teach the medical soldier the methods of rendering quick and efficient emergency medical treatment so as to permit him to meet any medical emergency likely to occur in field medical service with confidence born of knowledge and practice. .

2. Standard of Proficiency: The student will be able to render emergency medical treatment to open wounds of all types, sprains, dislocations, and fractures of all types, traumatic shock, unconscious or semiconscious conditions, burns, head injuries, and abdominal pains.

3. Basic References: FM 8-50; FM 21-11; TM 8-220.

First Period - One Hour  
Wounds (Types and General Treatment), Hemorrhage,  
Pressure Points, Digital Pressure, and Tourniquet Points

Place: Classroom

References: TM 8-220, pars 140, 141, 142/21 and 143; FM 21-11, pars 2, 6, 8, 7, 9, 11, 12, and 13; FS 8-41

Instructional Aids:

Personnel: Projectionist  
One man for demonstration

Equipment: Training charts; projection machine; models showing types of wounds; first aid dressings; FS 8-41

Individual Equipment: Notebook and pencil

1st Hour - Conference and Demonstration

Points to be Covered:

1. Principal kinds of wounds;

- a. Aseptic
- b. Septic
- c. Poisoned wounds

2. Main dangers of wounds:

- a. Hemorrhage
- b. Shock
- c. Infection

3. Steps in treatment of wounds:

- a. Expose wound
- b. Stop hemorrhage

- (1) Elevation
- (2) Pressure points
- (3) Pressure bandage
- (4) Hemostat
- (5) Tourniquet

- c. Prevent shock

- (1) Elevation of feet
- (2) Maintain normal body temperature
- (3) Keep quiet
- (4) Mention morphine
- (5) Mention plasma

d. Prevent infection

- (1) Wound tablets
- (2) First Aid dressing

e. Evacuate to a medical officer or installation.

4. Precautions in wound treatment.

5. Types of wounds - A wound is a break in the skin, or in the mucous membrane of one of the body cavities.

- a. Incised
- b. Lacerated
- c. Contused
- d. Puncture
- e. Gunshot
- f. Poisoned

6. Varieties of hemorrhage

- a. Arterial
- b. Venous
- c. Capillary

7. Discuss the characteristics of each of the above.

8. Discuss and demonstrate:

a. Pressure Points

- (1) Temporal
- (2) Facial
- (3) Carotid
- (4) Subclavian
- (5) Brachial
- (6) Femoral

b. Tourniquet points

- (1) Brachial
- (2) Femoral

c. Use of tourniquet

- (1) Dangers
- (2) Importance of notation with time on EMT
- (3) Tourniquet precautions

9. Discuss treatment following hemorrhage:

- a. Apply dressing
- b. In severe cases apply splint to prevent recurrence of hemorrhage.
- c. Once hemorrhage is stopped, do not remove bandage.
- d. Do not probe or remove blood clot.
- e. Plasma and blood transfusion.

10. Discuss briefly internal hemorrhage.

Training Notes:

1. Make extensive use of charts and models showing types of wounds.
2. Emphasize sections above relating to dangers of wounds, steps in treatment and precautions. If time permits, make mention of such special wounds as sucking wound of the chest, amputations and head wounds, and discuss their specific treatment.
3. Mention hemostat as a control of hemorrhage merely to acquaint the students with its use. Procure several types of hemostats for demonstration purposes.
4. Emphasize that a tourniquet is used only as a last resort, and explain the reasons.
5. Use only those parts of FS 8-41 that are applicable to this period.
6. If desired, the demonstration may include drawing red and blue lines on the body of a demonstrator to indicate the path of the blood vessels.
7. In addition to the six pressure points mentioned above, the axillary and popliteal pressure points may also be mentioned.
8. The essentials of a good pressure point area are that the vessel is closer to the surface and that there is a bone below on which the vessel may be compressed.

Second Period ~ One Hour

Bandages (Roller & Triangular)

Place: Classroom

References: FM 8-50, pages 2, 7-10, 12, 15, 16, 19-21, 31, 34, and 39; TM 8-220, pars 124-129, pages 100-108.

Instructional Aids:

Personnel: Two or more demonstrators for each platoon

Equipment: Training charts; moulages, compresses; and necessary roller bandages; Two (2) Triangular bandages and one piece of cloth 3' x 3'.

Individual Equipment: One 1", one 2", one 3" roller bandage for each student; one moulage and compress per team.

TM 8-220: One triangular bandage.

Conference and Demonstration

Points to be Covered:

1. Conference (To include demonstration where applicable)

a. Use of bandages

- (1) To retain dressings
- (2) To give support to parts of the body.
- (3) To maintain pressure in the control of hemorrhage, to assist in the absorption of fluids, and as a tourniquet.
- (4) To help keep foreign material out of wounds.
- (5) To immobilize a part of the body, alone or in combination with splints.

b. Rules for bandaging

- (1) The roll is held in the right hand ordinarily, the free end held in place with the left hand until anchored. Anchoring is usually done by repeating the first turns two or three times.
- (2) Bandages should be applied smoothly and snugly but not tightly enough to stop circulation.
- (3) Allow for shrinkage in applying a wet bandage.

- (4) Skin surfaces should not be brought together without padding. Sweating will cause maceration of unpadded skin surfaces.
- (5) In bandaging a part, bandage it in the position it will occupy when finished. If possible, leave fingers and toes uncovered.
- (6) All roller bandages should be anchored at the beginning and at the end.
- (7) When removing bandages, completely remove the bandage before rolling it.
- (8) Work close to the part being bandaged, with the roll pointed away from the patient.

## 2. Demonstration.

a. Circular Bandage: Use for retention of dressings on small portion of extremities, for retaining a pressure dressing, and as an anchor for bandages of the extremities.

b. Spiral Bandage: Used for retention of dressings, and as a basic bandage in making more complicated bandages.

c. Oblique Bandage: Used for retention of large, loose dressings such as hot, wet dressings which are frequently changed.

d. Recurrent Bandage: Used as a basic part of hand, head, and foot bandage.

e. Figure-of-eight bandage: Used as a part of many body bandages and as a supporting bandage of certain joints.

- (1) Figure-of-eight on the hand and ankle.
- (2) Figure-of-eight on the forearm and elbow.

f. Spiral Reverse Bandage: Used for retaining dressings on arm and leg, and to cover splint.

g. Spica Bandage of the Foot: Used for retention of dressings on the foot and as a support for a sprained ankle.

h. Use of triangular bandages.

i. Demonstrate making a triangular bandage from any piece of cloth available, size 3' x 3'.

### Training Notes:

1. The demonstrator should always use a moulage & compress when demonstrating.
2. Since many bandages are used for retaining dressings, use dressing part of the time beneath the bandages.
3. Emphasize that bandages should never be used directly over a wound. They should be used only over a dressing.
4. Use square knots in tying bandages.

Third Period - One Hour

Fracture, Types, Symptoms, Complications and Treatment

Place: Classroom

References: TM 8-220, pars 130, 138, 146, 147, 149, and 151. FM 21-11, pars 14-27; 40-44; 50, 51; FM 8-50; TB Med 151 and 175/45 Army Med Dept Bulletin Sep 45, pages 262, 263, 302-304. "Textbook of Medicine," Cecil, pages 595-600; 1261, 1539, 1541, 1624-1632; "Textbook of Surgery," Christopher, pages 308-309, 1174-1179.

Instructional Aids:

Personnel: Demonstrators

Equipment: Training charts; moulages; wound dressings; improvised splinting materials; tourniquets; and necessary bandages blackboard and chalk.

Conference and Demonstration

Points to be Covered:

1. Conference

a. Define fractures

- (1) Simple fractures
- (2) Compound fractures
- (3) Complicated fractures
- (4) Signs and symptoms of fractures

b. Types of fractures

(1) Fractures classified as to type of break

- (a) Green-stick
- (b) Linear
- (c) Spiral
- (d) Comminuted
- (e) Depressed

(2) Fractures classified as to deformity

- (a) Angular
- (b) Lateral
- (c) Over-riding
- (d) Rotating

c. Signs and symptoms of fractures

d. Purpose of splinting fractures

2. Discuss briefly dislocations and sprains

a. Define

- (1) Dislocation
- (2) Sprain

b. Discuss dislocations

- (1) Cause
- (2) Symptoms
- (3) Treatment

c. Discuss Sprains

- (1) Cause
- (2) Symptoms
- (3) Treatment

3. Prophylaxis

4. Causes of burns and types of burns

- a. Thermal
- b. Chemical
- c. Electrical
- d. Sunburn

5. Classification of burns

- a. 1st Degree
- b. 2d Degree
- c. 3d Degree

6. Symptoms and results of burns

- a. Local
- b. General

7. Special features of burns

8. Treatment of burned patient (2d and 3d Degree burns)

- a. General
- b. Local

9. Burns

a. Principles

- (1) Prevention and control of shock by the adequate use of plasma. In extensive burns, quantities of plasma up to twelve (12) units may be required in the first 24 hours.
- (2) Relief of pain with morphine. Large doses of morphine should be avoided if amnesia is present.
- (3) Prevention and control of infection by aseptic precaution.

10. Sunstroke, heat exhaustion, and heat cramps.

a. General rules of prevention

11. Sunstroke (also known as heatstroke) is often caused by direct rays of the sun, but also may occur even when a person has been under cover.

- a. Symptoms
- b. First aid measures

12. Heat Exhaustion

- a. Symptoms
- b. First aid measures

13. Heat Cramps

- a. Symptoms usually occur after a person has been sweating a great deal, especially if extra amounts of salt have not been taken.
- b. Prevention.
- c. First aid measures.

14. Unconsciousness

- a. Causes of unconsciousness
- b. Treatment in general

15. Fainting

- a. Fainting
- b. Symptoms
- c. Treatment

16. Epilepsy or fits

- a. In this condition there may be fits with insensibility, or a momentary unconsciousness with slight muscular twitching but in which the patient does not fall.
- b. Treatment
- c. Epilepsy feigned in military service

17. Head injuries (con't page 10)

a. A term when a person has been "stunned" or "knocked out" by a blow on the head.

b. Symptoms

c. Treatment

18. Compression of the brain and apoplexy

a. Pressure on the brain due to a piece of broken bone from the skull or to blood from a torn tissue.

b. Symptoms

c. Treatment

(1) Keep the patient quiet

(2) Apply cold compresses on the head

(3) Do not administer stimulants

19. Hysterical unconsciousness

a. Hysteria is a disease of the nervous system, accompanied by loss of control over the emotions.

b. Symptoms

c. Treatment

20. Uremia or Bright's Disease

a. It is acute poisoning from the waste products

b. Symptoms

c. Emergency treatment

21. Unconsciousness caused by acute alcoholism

a. Be careful of diagnosis on these cases

(1) Cases of apoplexy or fractured skull have been diagnosed acute alcoholism.

(2) Give the patient the benefit of the doubt.

(a) A drunk person can usually be aroused and asked questions.

b. Symptoms

c. Treatment

22. Pain in the abdomen

a. Causes

b. Treatment

23. Questions

Training Notes:

1. Clothing and undershirts will serve as padding for the improvised splint.

2. Two types of improvised splints are used for fractures of the lower extremities.

- a. Upper leg including knee fractures: Padded long splint or reinforced U-shaped blanket support.
- b. Lower leg including ankle: Padded short splints or U-shaped blanket support extending beyond foot and above knee joint.
- 3. Use a skeleton for pointing out to student the construction of joints and ligaments protecting them.
- 4. While describing the symptoms of sunstroke and heat exhaustion, have a demonstrator act the part as the instructor is describing the symptoms. At the end of the class, using demonstrators, demonstrate to the class a comparison of the two, including first aid treatment.
- 5. A demonstration of putting two (2) salt tablets into a canteenful of water and also putting 1/4 teaspoonful of salt in a canteen of water at the time the instructor is discussing preventive measures will make more of an impression on the student than talking about them.

EMPLOYMENT OF MEDICAL DEPARTMENT UNITS

PERIOD	HOURS	WEEK	SUBJECT
1	1	1	Echelonment of Evacuation; Organization of Medical Department Units; Combat Evacuation. (conference)
2	1	1	Selection of Sites for Tactical Medical Department Installations; Relationship of Tactical Installations to Evacuation Facilities from Battlefield to Zone of the Interior.
2			TOTAL

1. Purpose and Scope: To present the organization of the various units in the chain of evacuation from the battlefield through the combat echelons to the Zone of the Interior, and to place these units in their proper relationship and positions in the chain.

2. Standard of Proficiency: Each student must be able to:

a. Visualize the chain of evacuation in terms of the various units.

b. Understand the relationship of each link in the chain to supporting units and to each other.

c. Understand the general scope of technical procedures performed by each link in the chain of evacuation.

d. Know the general responsibilities of each link in the chain of evacuation from the battlefield to the Zone of the Interior in fulfilling their respective portions of the mission of the Medical Department.

e. Gain a realization of the hazards and obstacles of battlefield treatment and evacuation.

First Period - One Hour  
Echelonment of Evacuation; Organization of Medical Department Tactical Units; Combat Evacuation.

Place: Classroom

References: FM 7-30, Ch 7; FM 8-5 Ch 2 and 4; FM 8-10, Ch 2.

Instructional Aids:

Personnel: none,

Equipment: Blackboard.

Individual Equipment: Notebook and pencil.

CONFERENCE

Points to be Covered

Introduction:

1. Outline the chain of evacuation, through its various echelons, from the Company Aid man to the Zone of the Interior.

Conference:

1. Organization of Medical Department Tactical Units:

a. Medical Detachment with Combat Unit (Inf Regt, Arty Bn, Engr Bn, etc)

- (1) Station Section
- (2) Litter Sections
- (3) Company Aid Men

b. Collecting Company

- (1) Ambulance Platoon
- (2) Litter Platoon
- (3) Station Platoon

c. Clearing Company

(1) Clearing Platoons (2), with brief discussion of reasons for two (2) such platoons.

2. Brief exposition of hospital facilities in support of Tactical Units.

- a. Field Hospital
- b. Evacuation Hospital
- c. Surgical Hospital
- d. Numbered General Hospital
- e. Convalescent Hospital

3. Outline evacuation chain through the various installations operated by the units listed above.

a. Show methods of evacuation, processing from hard carries through litter carriers, ambulances, other vehicles, ships, trains, aircraft.

4. Explain the flexibility of all Medical Department units to allow alteration to fit abnormal situations. Explain that the unusual situation is the rule, rather than the exception; that the following is required:

a. Constant improvisation to meet changing situations and circumstances.

b. Use of natural and native advantages.

Conclusion:

1. Review points covered. Encourage discussion and questions. Prepare questions to promote discussion.

Second Period - One Hour

Selection of Sites for Medical Department Tactical Installations;  
Relationship of Tactical Installations to Evacuation Plan;  
Operation of Evacuation Facilities from Battlefield  
to Zone of the Interior.

Place: Demonstration Area

References: All Previous References

Instructional Aids:

Personnel: 2 Enlisted assistants to aid with demonstration terrain.

Equipment: Demonstration terrain features including (buildings, bridges, and vehicles.)

Individual Equipment: None

3d and 4th Hours - Conference and Demonstration

Points to be Covered

Introduction:

1. Review the chain of evacuating, organization of Medical Department Units, and combat evacuation problems as outlined in first period.

## Conference and Demonstration

### 1. Describe the Battalion Aid Station and its setup.

a. Explain the features necessary for siting the Battalion Aid Station. Discuss advantages and disadvantages of various sites on demonstration terrain, and finally place the installation. Discuss Aid men and litter-bearers and their responsibilities as initial units of the evacuation chain. Picture a casualty starting toward the rear.

### 2. Describe the Collecting Station and its setup.

a. Discuss siting in relation to Battalion Aid Stations, lines of drift there from, and vehicular routes to facilitate evacuation of the Aid Stations. Site Collecting Station and bring imaginary casualty to that point.

### 3. Describe the Clearing Station and its setup.

a. Discuss siting in relation to Collecting Stations, vehicular and walking routes from them, emphasizing the fact that the Clearing Station serves an entire division, with 12 to 16 or more Aid Stations funneling their loads into the one Clearing Station. Site the Clearing Station and bring the imaginary patient to that point. Remind students that this is where Emergency Treatment ends and definitive, more elaborate treatment begins. Establish fact that often there is a mobile Hospital installation in the vicinity where chest and abdominal emergencies may be operated on.

4. Site Field, Evacuation, Convalescent, and numbered General Hospitals in relation to Clearing Station and to routes of evacuation. Point out fact that many casualties are treated and returned to their organizations from one of those installations. Move imaginary patient to one or more of those.

5. Bring imaginary patient to the Zone of the Interior. Re-emphasize the mission of the Medical Department, "To Conserve the Fighting Strength," and remind the students that the entire chain of evacuation and treatment is established for the furtherance of this mission.

6. Summarize points covered. Re-emphasize main points. Ask for questions. Promote discussion.

## HISTORY OF THE MEDICAL DEPARTMENT

PERIOD	TIME	WEEK	SUBJECT
1	30 Min.	1	Medical Department From 1775 to World War I.
2	30 Min.	1	Medical Department From the Beginning of World War I to date.
2	1 Hour		TOTAL

1. Purpose and Scope: To give the student an understanding of the evolution of the Medical Department, its place in military and medical history, and its pride in its achievements and standards.

2. Standard of Proficiency: A highly developed "esprit de corps" as a result of a knowledge of the background and achievements of the Medical Department, its colors, traditions, and insignia.

3. References: Military Medical Manual; "History of the Medical Department," Ashburn; current files of "The Bulletin of the U.S. Army Medical Department."

First half of period - 30 minutes  
Medical Department From 1775 to World War I

Place: Classroom

References: "History of the Medical Department," Ashburn; MM, pages 331-344.

Instructional Aids:

Personnel: Instructor

Equipment: Flash cards (Insignia); blackboard

Individual Equipment: Notebook and pencil

1st Half Hour - Conference

Points to be Covred

Introduction

1. Sketch briefly the Medical Service in ancient history, and the recognition of its importance by ancient and medieval military leaders.

2. Impress the meaning of the motto "To Conserve the Fighting Strength."

Conference

1. Re-emphasize and discuss the mission of the Medical Department.
2. Give a brief sketch of the organization of the Medical Department.
  - a. Administrative Organization:
    - (1) The Surgeon General
    - (2) The various corps which compose the Medical Department: MC, DC, PC, MAC, VC, ANC, SnC, PhTh, HD, Contract Surgeon.
  - b. Tactical and Service Organization:
    - (1) Units of the combat zone.
    - (2) Units of the communications zone.
    - (3) Units of the Zone of the Interior.
3. Point out how vital the service of the Medical Department is to the Army, and how commanders have recognized this importance by a discussion of:
  - a. Its role in the War for Independence.
  - b. The War of 1812.
  - c. The organization of the modern Medical Department under the first Surgeon General (Gen Lovell) during the period 1818-1836.
  - d. Utilization of the Medical Department during the Mexican war.
  - e. During the War between the States, emphasizing the birth of modern evacuation methods and medical service in the field.
  - f. The growth and change during and throughout the Spanish-American War, including the birth of the ANC and the foundation of the Army Medical School.
  - g. The contributions of the Army Medical Department to the combat of insect-borne diseases, and to the uses of vaccines.

Second Half of Period - 30 Minutes  
Medical Department From the Beginning of  
World War I to Date

Place: Classroom

References: "History of the Medical Department," Ashburn; MMM, pages 345-373; Current files of "The Bulletin of the U.S. Army Medical Department

Instructional Aids:

Personnel: Instructor

Equipment: Blackboard

Individual Equipment: Notebook and pencil

2d Half Hour - Conference

Points to be Covered:

Introduction

1. Review material covered in First Period, including Administrative and Tactical Organizations, various Corps, mission, colors, history of the Medical Department up to the First World War.

Conference

1. Status of the Medical Department at the beginning of World War I:

a. Organization

b. Transportation of units

c. Methods of training

d. Special problems of static warfare, and the Medical Department's methods of transportation and evacuation of sick and wounded.

e. Summarize Medical Service during World War I, emphasizing huge casualty lists, great increase in hospital facilities, heavy casualties in the Medical Department itself. (First officer and enlisted man killed were of the Medical Department.)

2. Professional advancement of the Medical Department after World War I.

a. List Surgeon Generals

b. Organization of Reserve Units.

c. Drastic reorganization of tactical units and the employment thereof.

d. Foresight in preparing for medical service to fast-moving combat tactics, with advances in evacuation and clearing methods.

3. Status of the Medical Department at the beginning of World War II.

a. The Regular establishment.

b. The Reserve establishment, including ORC and National Guard.

4. Medical Service during World War II

a. Types of tactical units, including Combat Zone, Communications Zone, and Zone of the Interior.

b. Research, development, and use of Sulfas, Penicillin, Atabrine, etc.

5. The future of the Medical Department

a. Opportunities for educational and professional advancement, both in the service and after separation.

## MEDICAL EQUIPMENT

PERIOD	HOURS	WEEK	SUBJECT
1	1	1	Medical & Dental Kits-Private's and the Officer's and Noncommissioned Officer's (Conference & Demonstration)
	1		Standard Medical Department Chests (Conference & Demonstration)
1			<b>TOTAL</b>

1. Purpose and Scope: The purpose of this instruction is to enable the students to identify and use the correct terminology for organizational equipment, to properly care for this equipment and know its use.

2. Standard of Proficiency: Each student to know the location, be able to identify, know the use, and be able to care properly for essential items of organizational equipment that he may be expected to handle in the care and treatment of the sick and wounded.

3. Basic References: FM 8-5; FM 8-10, Appendices, I, II, III

First Half of Period - 30 minutes

Medical and Dental Kits - Private's and the Officer's and Noncommissioned Officer's

Place: Classroom

References: FM 8-10, Appendix I, pars 1a, 1b, 1c, and 2b; Medical Department Supply Catalogue for contents of kits.

Instructional aids:

Personnel: Two noncommissioned officers to demonstrate how to wear the kits.

Equipment: Medical kits, Private's and Noncommissioned Officer's one litter; demonstration boards containing contents of such kits.

Individual Equipment: Notebook and pencil.

Points to be Covered:

1. Conference

- a. Define and demonstrate expendable and non-expendable medical supplies.
- b. Discussion of property responsibility, care, and safekeeping of property.
- c. Discuss what is found in the kits and what these things may be used for.
- d. Discuss the proper wearing of the kits and use of litter straps.

2. Demonstration

a. Following parts:

- (1) Kit, pouch, canvas
- (2) Kit, pouch, leather
- (3) Kit, insert Type I
- (4) Kit, suspender
- (5) Kit, cantle ring strap
- (6) Kit, litter strap

- b. The assembling of the kit; normal and expansion capacity.
- c. The contents of the kit, and the use and care of each item.
- d. The use of the litter straps and cantle ring straps.
- e. Proper method of wearing kits with full field equipment.
- f. Demonstrate method of preparing and giving a hypo and use of drugs in the kits.

3. Mention the Dental and Officer kits.

4. Brief quiz over material covered.

Training Note: Stress not only nomenclature, but also use of material in the kits.

Second Half of Period - 30 Minutes

Standard Medical Department Courses

Place: Classroom

References: FM 8-10, Appendix II, pars 1a, 1b, 2a, 2b, 2c, 2d, 2g, 2h, and 2i; Medical Department Supply Catalogue for contents of Chests

Instructional Aids:

Personnel: Two (2) noncommissioned officers to assist in demonstrations.

Equipment: MD Chests #1, #2, #4, #60; litter; litter bar; splint unit; blanket set; lantern unit; gas casualty set; plasma set; and flag, Geneva Convention.

Individual Equipment: Notebook and pencil.

Points to be Covered:

1. Conference

- a. Discuss in general the locations of units in which MD Chests #1, #2, and #4 will be found.
- b. Name the various items of equipment found in each chest.
- c. Discuss their care and preservation.
- d. Give the nomenclature and uses of the instruments found in MD Chest #2.
- e. Stress briefly the care, cleaning, and storage of surgical instruments.
- f. Discuss briefly the contents of MD Chest #60.

2. Demonstration

- a. Unpack the chests and set up MD Chest #2 and #4.
- b. Improvised dressing or operating table.
- c. Dressed litter.
- d. Shock litter.
- e. Use of chest trays for dressing tables.

## MEDICAL RECORDS

PERIOD	HOURS	WEEK	SUBJECT
1	1	1	Emergency Medical Tag and Field Medical Records (Conference)
2	1	1	Field Medical Card & Field Medical Record Jacket (Conference), Demonstration, and Application
2			TOTAL

1. Purpose and Scope: To impress the medical soldier with the importance of medical records in the field. To instruct him in the purpose and use of the Emergency Medical Tag and the Field Medical Record, and to train him to prepare quickly and accurately: The Emergency Medical Tag on the wounded in action, the killed in action, and cases other than battle casualties; the Field Medical Card and the Field Medical Jacket; and the Patient Roster.

2. Standard of Proficiency: Each student must know when and how to make out the Emergency Medical Tag, Field Medical Record, and the Patient Roster.

3. Basic References: AR 40-1025

First Period - One Hour

Emergency Medical Tag and Field Medical Records

Place: Classroom

References: AR 40-1025, Sec I, II, VIII, XIII, XVI.

Instructional Aids:

Personnel: None

Equipment: One book of Emergency Medical Tags (WD AGO Form 8-26); one Field Medical Card (WD AGO Form 8-27); one Field Medical Record Jacket (WD AGO Form 8-28)

Individual Equipment: One Emergency Medical Tag (D AGO Form 8-26); one Field Medical Card (D AGO Form 8-27); one Field Medical Record Jacket (D AGO Form 8-28)

1st Hour - Conference

Points to be Covered:

1. Importance of Medical Records in the Field:

- a.. Provide record of condition and treatment to guide medical personnel in further treatment.
- b.. Basis for casualty reports.
- c.. Aid in deciding line of duty and pay status of patient.
- d.. Used in ~~settlement~~ of claims for pension or disability.
- e.. Statistical data made available as to percentage, type, and cause of casualties.
- f.. Information on which to base and plan our medical service.

2. Forms Used:

- a.. EMT used by units other than hospitals.
- b.. Field Medical Card and Field Medical Record Jacket, collectively referred to as the Field Medical Record, used by numbered hospitals.

3. Use of Emergency Medical Tag:

- a. Where used: In theater of Operation and in Zone of Interior, when in the field on maneuvers, or moving between stations.
- b. On whom used: Cases wounded in action, killed in action, transferred to hospital, admitted to quarters, and carded for record only.
- c. When and by whom initiated:
  - (1) On the living patient, initiated by the first Medical Department officer who treats patient; enlisted man may prepare tag for officer's signature.
  - (2) On the killed in action, initiated by the first member of the Medical Department, usually an enlisted man, who examines the remains.

(3) Initiated by enlisted man as an informal record of treatment to inform the medical officer what has been done, such as tourniquet applied, narcotic administered, etc.

d. Tied to patient's clothing over chest.

e. Information entered on EMT

f. Upon admission to hospital, entry to that effect added to back of EMT and record considered closed. The EMT is included with other medical records in the Field Medical Record Jacket.

4. Disposition of original copy of Emergency Medical Tag:

a. Case evacuated or transferred to hospital: EMT accompanies patient.

b. Case returned to duty from aid station, collecting station, or clearing station: EMT will remain at medical installation that made the disposition.

c. Case dies before admission to hospital: EMT remains tied to body until burial.

d. Upon burial: EMT removed by accompanying Medical Department personnel and returned to their medical organization. If burial is accomplished by a burial detail, EMT is removed and temporarily retained by Graves Registration Service.

e. Final disposition of EMT: Forwarded to the Surgeon General with report of sick and wounded.

5. Disposition of duplicate copy of EMT: Left to discretion of Surgeon of the Theater of Operations. No copies will be sent to Surgeon General.

6. Use of Field Medical Record:

a. Where used: In hospitals in Theater of Operations and in hospitals in Zone of Interior when in the field on maneuvers.

b. On whom used: Every case admitted to hospital.

c. When initiated: Upon admission to first hospital where patient is treated.

d. Tied to bed in combat area while patient is in hospital; tied to patient's clothing over chest while moving between hospitals; outside combat areas, may be kept in current file while patient is in hospital.

e. Additional information added to FMR as patient passes through each hospital.

f. Upon admission to hospital on a post in Zone of Interior, entry to that effect added to FMR and record is considered closed.

7. Disposition of Field Medical Record:

- a. Case evacuated or transferred: FMR accompanies patient.
- b. Case returned to duty from hospital: FMR retained by hospital.
- c. Case dies in hospital: FMR retained by hospital.
- d. Final disposition of FMR: Forwarded to The Surgeon General.

Second Period - One Hour

Field Medical Card and Field Medical Record Jacket

Place: Classroom

References: AR 40-1025, Sec XIII

Instructional Aids:

Personnel: Cadre to assist students in preparation of Field Medical Card and Field Medical Record Jacket.

Equipment: Large charts representing Field Medical Card and Field Medical Record Jacket; mimeographed situation "D"

Individual Equipment: Mimeographed situation "D" to be drawn by instructor

Conference:

Points to be Covered:

1. Review use of Field Medical Record.

2. Using mimeographed situation "D", instructor will explain entries on large charts. Each student will fill in spaces on situation "D", Field Medical Card form, along with instructor's explanation.

3. Demonstrate Field Medical Card.

a. Last name, first name, middle initial, and Army Serial Number verified from identification tag. Enter "none" if no middle initial.

b. Grade, company, regiment, division, and arm or service of patient, using authorized abbreviations.

c. Age: Reported as of last birthday. His age at initial admission will be carried until final disposition is made of case.

d. Race: The symbols W, N, F, PR, CH, JP, MX, and I, will be used to designate White, Negro, Filipino, Porto Rican, Chinese, Japanese, Mexican, and American Indian patients respectively. Nationality of other patients will be fully stated.

e. Service: Total completed service in years and monthly fractions thereof; for example, "6/12," "3-7/12;" up to (but exclusive of) the day of initial admission.

f. Source of admission: Enter "Direct" if patient belongs to the command of reporting medical installation or from organizations attached to the command, including those attached for medical care only. In all cases received by transfer, the designation of the medical installation transferring the patient will be stated.

g. Received at hospital and location: Example, "48th Evacuation Hospital, Guadalcanal."

h. Date: Day, month, and year on which admitted to hospital.

i. Diagnosis: Same requirements as for Emergency Medical Tag.

j. Line of duty: "Yes," "No," "Undetermined."

k. Change and additional diagnoses; operations, with dates:

For diagnosis enter - date, diagnosis, and line of duty; for operations enter - date, operation.

l. Disposition: "Duty, general service;" "Duty, limited service;" "Died;" "Transferred to \_\_\_\_\_ Hospital," etc.

m. Date: Day, month, and year on which disposition takes place.

n. Signature of surgeon: "John J. Doe, Capt, MC."

o. Additional entries made by other hospitals follow in same fashion.

4. Demonstrate Field Medical Jacket.

a. Transportation memoranda.

b. Brief of case.

c. Statement "Copy of this FMR was forwarded, etc," does not apply.

ORGANIZATION AND FUNCTION OF MEDICAL DEPARTMENT UNITS

PERIOD	HOURS	WEEK	SUBJECT
1	1	1	Steps of Evacuation; First and Second Echelons of Medical Service; The Clearing Station.
2	1	1	Second, Third, Fourth, and Fifth Echelons of Medical Service.
2			<b>TOTAL</b>

1. Purpose and Scope: To acquaint the enlisted man with the mission of the Medical Department and its function as part of the Army of the United States. To give the enlisted man an idea of the organization of the Medical Department and its several component corps of specialists. To explain the echelons of the Medical Service and the reasons for their existence, with the type of units to be found therein.

2. Standards of Proficiency: The enlisted man will know:

a. Mission of the Medical Department.

b. The five steps of evacuation.

c. How and why a man is evacuated.

d. A broad concept of the general plan for evacuation of the wounded in a theater of operation.

e. To understand the organization and function of units within the five steps of evacuation and the services rendered by these units.

3. Basic References: FM 8-5

First Period - One Hour  
Steps of Evacuation; First and Second Echelons of Medical Service

Place: Classroom

References: FM 7-30, Chap 4, 7; FM 8-5, Chap 2; FM 8-10, Chap 2, Sec II

Instructional Aids:

Personnel: None

Equipment: Display chart showing Plan of Evacuation of Wounded  
Display chart showing Organization of Regimental  
Medical Detachment  
Display chart showing First Echelon of Evacuation

Individual Equipment: Notebook and pencil

1st Hour - Conference

Points to be Covered:

1. Explain the term "evacuation."
2. Problems of evacuation.
  - a. The withdrawal must be made against a constant forward flow of troops and supplies, and interference must be kept to a minimum.
  - b. Evacuees are unorganized. They are not self-supporting but require individual care and treatment through all stages of their withdrawal.
  - c. In forward areas specifically, evacuation must be carried on at times under difficult conditions of weather, terrain, and combat.
3. The chain of evacuation. Use the display board. Point out how the casualties, wounded near the front line, are evacuated.
  - a. Company aid men with companies at the front treat the men.
  - b. Litter bearers carry him to the aid station.
  - c. A medical officer assisted by enlisted men of the Medical Department treats the man at the battalion aid station.
  - d. The casualty is transported by collecting company litter bearers to the collecting station.

e. The casualty is further treated by medical officers and enlisted men of the collecting station.

f. The man is now transported by ambulance of the same collecting station to the clearing station.

g. At clearing station he receives further treatment. All through this chain of evacuation, attempts are made to return this man to his organization if his condition does not warrant further evacuation.

h. Ambulances from separate ambulance companies in convoy now transport the casualty from the clearing station to the evacuation hospital.

i. Casualty is now moved by ambulance convoy, by transport plane, by ship, or by railroad to a general hospital or a hospital center.

j. If the casualty requires prolonged hospitalization, he will be evacuated by hospital ship or transport plane to a named general hospital in the United States.

4. The relation of the Medical Detachment to the regiment.

5. Outline the organization and function of the medical detachment of the infantry regiment.

a. Headquarters section.

b. Battalion medical sections.

(1) Battalion aid station group.

(a) Discuss the aid station, its location, and function.

(2) Company aid group.

(a) Describe briefly the duties of the company aid men.

(3) Litter bearer groups.

(a) Describe the duties of the litter bearer squads.

6. Brief discussion of other detachments to emphasize that all units the size of a battalion or larger, except medical, will have their detachments.

7. Review the mission of the Medical Department.

a. Explain the general responsibilities of the Regimental Medical Detachment in fulfilling its portion of the mission.

8. Organization of the Medical Battalion (briefly)

9. Discuss the Collecting Company and its component parts with reference to:

a. Organization

b. Function; Contact, evacuate, treat, transport.

- (1) Liaison Section
- (2) Litter Bearer Section
- (3) Station Platoon
- (4) Ambulance Platoon

c. Relations with other units.

- (1) Regimental Medical Detachment
- (2) Clearing Station

d. Explain the ambulance shuttle system.

Points to be Covered:

10. Discuss briefly the Headquarters and Headquarters Detachment, Medical Battalion, with reference to:

a. Organization

b. Function

c. Relations with collecting and clearing companies

11. Discuss the Clearing Company, Medical Battalion, with reference to:

a. General Function of clearing elements.

b. Organization of Clearing Company.

c. Organization and function of Company Headquarters.

d. Organization and function of Clearing Platoon.

e. Employment and transportation of Clearing Company.

f. Location of Clearing Station.

(1) Position of chain of evacuation.

(2) Desirable and undesirable features for locating Clearing Station.

g. Arrangement of Clearing Station.

(1) Under conditions where the enemy respects the Geneva Red Cross.

(2) Under conditions where it is necessary to employ concealment and camouflage.

**Second Period - One Hour**

**Third, Fourth, and Fifth Echelons of Medical Service**

Place: Classroom

References: FM 8-5, Chap 9, 17; TM 8-260

Instructional Aids:

Personnel: Projectionist

Equipment: Display chart showing Plan of Evacuation from Division Area to and including the ZI  
Film Bulletin #132  
Projector

Individual Equipment: Notebook and pencil

**Second Hour - Conference**

**Points to be Covered:**

1. Brief review of how a casualty is evacuated from the front lines through the various medical installations to the Clearing Station. (First and second steps in the chain of evacuation).
2. Function and employment of the evacuation hospital.
  - a. Third step in the chain of evacuation.
  - b. Where the hospital is employed.
  - c. A mobile unit.
  - d. Concept of size and capacity.
  - e. Controlled by Army.
3. Function and employment of the regulating station and all hospitals in the Communications Zone.
  - a. Fourth step in the chain of evacuation.
  - b. Where the various installations are employed.
  - c. Concept of size and capacity, briefly.
4. Named General Hospitals.
  - a. Fifth step in chain of evacuation.
    - (1) Terminus in evacuation.

- b. Located in the United States.
- 5. Introduce Film Bulletin #132 (Evacuation of Wounded).
- 6. Show Film. (15 minutes)
- 7. Summary and questions.

1. Purpose: One (1) hour within the Course has been allotted to the Chaplain to aid him in meeting his responsibilities for the moral and spiritual welfare of the students.
2. References: SGO Circular No. 19, 6 February 1947.
3. Emphasis will be placed on citizenship and morality in their relation to wholesome living in general and to the venereal disease problem in particular.





